SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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THE PRESENT CONDITION OF THE LABOUR MARKET—THE PRODUCER AND THE CONSUMER—No. III.

BY GEORGE SHEPHERD, C.E.

If, instead of Lord Macaulay's New Zealander waiting until he can stand on the ruins of London Bridge, and visit the roofless St. Paul's Cathedral, to contemplate the past of the once mighty English nation; I say, instead of waiting for that remote period of our future history, if this imaginary person were to visit England at once, and some person were to put in his hands the *Mining Journal*, and the excellent statistics compiled by Mr. R. Hunt, on the Mineral Resources of England, showing the immense, nay, almost fabulous, amount of coal, iron ore, and other metals raised and manufactured annually; and after he had got over his first astonishment, the same person were to inform him that all that mineral wealth was produced at a price which tended to banish our skilled labourers from England, and be at times unremunerative even to the coal and ironmasters themselves, I apprehend his astonishment would be much greater than that of his remote countryman coming to contemplate the ruins of the once great London. His first question would be—"With all this mineral wealth, and ready hands to labour, however have you managed your business to bring your affairs into such a state?" He would, perhaps, be told that 10 years ago we had an over-abundant supply of labour, and also an over-abundant supply of wealth. These alone produced a ruinous competition in trade, and hence the present crisis. It might take some time to solve this problem satisfactorily to himself; but he would at once be able to realise the full force of the expression of the immortal Bunyan—"That from the very gate of happiness there is a short bye-road to the gulf of perplexity and chaos."

We will leave our New Zealander to contemplate and digest the materials before him, and proceed with our narrative. At the commencement of the present century the price of iron in England varied from 17*l.* to 20*l.* per ton; at that time England was subsidising the great continental nations of Europe, to enable them to fight their *own* battles. Since the fall of Napoleon I., and the establishment of peace in Europe, England has been heaping her mineral wealth in the whole world. Iron could be obtained from England almost on any terms, including worthless Yankee railway bonds. Travel where we may on the Continent, we run over English rails, and are conveyed by engines made with English iron; the same with the steamships at sea, and steamboats on every navigable inland river; all these are from the iron and other metals obtained from England, at a rate before described. The foreigner is very ready to accuse John Bull of being selfish and exacting. But if the same foreigner who makes this accusation against England would go into the details, and learn something of the amount of wealth and labour which has been bestowed on him, he would find old John Bull and his sons the most generous and long-suffering beings in the universe.

The introduction of railroads, iron steam-ships, and other similar works, into England caused a terrible competition in the iron trade. No sooner were a seam of coal and a vein of iron ore discovered, than shafts were sunk and ironworks rose up as by magic; and with these a diamond-cut-diamond competition—or, in other words, a war *a la outrance* commenced. All classes—workman and master—seemed determined to keep up this game of beggar-my-neighbour. The weakest, of course, went by the board; the triangle duel, before described, raged furiously, and on the workman and masters fell all the blows—"public good" reaped all the benefit. But we are told the end of all things is at hand; so far as the late competition on the part of the workman is concerned, this is at an end. When competition meets competition, then comes the tug of war; and so far as the mineral wealth of England is concerned, it is all for the best the workman has put a stop to the late ruinous competition. Let us now hope for a better and a more healthy state of things, with more happiness and prosperity to both masters and workmen. Future generations will stand aghast when they record the past and present history of how the wealth of England was squandered away, and wonder at the folly of their forefathers. Of this the present age takes no account; the motto is,—Those who live the longest must fetch their fire the furthest. Well, be it so.

But we are told that all honest labour under the sun is worthy of its hire. If we take this view of the question, both master and workmen degrade themselves if they outrage this divine law, and retribution in one form or the other is the certain result. The present state of the labour market in our mining districts is ample evidence of our past folly; and the more either the workmen or their masters pander to comply with the avarice of *public good*, the more deeply will they sink in the mire. "Public good" is an insatiable gulf: it can neither be filled up or bridged over; it keeps no account even of its benefactors; it cries eternally—*give, give.* If the workmen and masters, as we have seen, were to give all but their shirts, "public good" would ask for those articles also: the more it receives the more it asks for. Public good has got its beggars in every form and in every shape. These say if you will do this, or give that, it will be for "public good." It now asks the industrious, inventive genius of England, the men who have already done so much to devote their time, talents, and money, to unravel the great mysteries of nature, and which they have perfected their discoveries, to give all to "public good," without fee or consideration. It tells them they ought to be contented with the empty honour of being the givers—much better is it to give than to receive. It asks the poor seamstress to make shirts at 2*s.* per dozen and ladies hair-nets at ½*d.* each, and "public good" is surprised these poor creatures cannot live on 3*d.* per day. It fills our prisons with crime, and our workhouses with poverty. It banishes our skilled workmen from their homes; when perplexity comes, it blames those it has crushed. In a word, it takes all, and still holds out its hand for more; it lifts up its voice in astonishment that its victims should turn and resent its importunities.

There is another picture of "public good," but that is equally discreditable: a year ago, a mountebank got 30,000*l.* in a few months for walking on a rope; a second a similar sum for springing from one stick to another, like a monkey—this was something for "public good" to stare at. A few months ago, an actor at one of the theatres realised 50,000*l.* for uttering very stupid things—this was something for "public good" to laugh at. In addition to this, we see "the gorgeous palaces, and the cloud-capped towers," rise on all sides as if by magic, with corresponding luxury everywhere.

As we ponder over these things, we ask the question, is not England preparing for that event described by our immortal bard, when Old Mother Earth will shake off all her load of iniquity, and "leave not a wreck behind?" Some men see in these outward emblems of great national prosperity, others think of the once luxurious Rome, now in the dust, and of the equally luxurious American Republic, now struggling between grim death and bankruptcy, and see signs of inward decay, and wonder what is to be the end of all the luxury England is now drifting into. Future generations of England will learn this to their cost.

Thinking men contrast this luxury with our discontented workmen, and the misery which abounds on all sides, and would prefer to see more general and less individual wealth. Need I dive into the bowels of the earth, and hold up to public gaze the ill-ventilated mines, where the collier earns his daily bread, with the deadly *fire-damp* for his only companion, and state what competition has done in our collieries? The past must make "angels weep," and even "devils tremble." I will not here lift the veil of the past, nor will I blame either workmen or their masters—both were impelled forward, each tried to be first in the late great race of competition. But as things have now come to a "crisis," let us hope for a better regulated system, and therewith a more healthy future for all parties interested—workman and master.

In my first paper I described the interests now at stake:—1. The workman, the producer of our national wealth.—2. The master or manufacturer, who embarks his capital to develope the mineral wealth of England.—3. The public consumer, who buys in the cheapest and sells in the dearest market. Let us look at these interests in whatever way we may, the only conclusion we can come to is that the two former have but one interest, and are bound together by links stronger than the iron they produce. The union between the two once severed, both are like a dismasted ship at sea in a gale, and at the mercy of the pitiless storm. The prosperity of the one is the well-being of the other; while strikes and perplexities, like the present, are alike ruinous to both. But the loss of the workmen, by emigration alone, is ruinous to the master; therefore, in the present condition of the labour market, his course now is not persecution, but conciliation, to keep his men about him. The difference between the masters and the men in the present strike is only 6*d.* per day. The masters resist the demand of the men on principle. The inimitable Mr. Weller informs us how a man once killed himself on principle. It appears to me the masters, with the present scarcity of labour, are determined to kill themselves on principle, but they must bear in mind that neither a dead man, a ruined man, nor yet a ruined interest, are worth much in this uncharitable world, while it is next to impossible to ruin a workman in good health.

THE NEW TURKISH MINING LAWS.

More than forty years have now elapsed since Mr. de Chancourtoi deposited his admirable geological collection, from Amasserah and Heraclea at the Ecole des Mines in Paris, yet comparatively little is even yet known of the mineral resources of the Turkish empire. Even the Exhibition of 1851, which was well calculated to introduce the subject to the notice of the British capitalist, passed by without effect, owing to the 200 specimens forwarded by the Ottoman Government having been scarcely unpacked when the jurors separated, whilst the fact of their being labelled in Turkish only prevented any interest being taken in them, except by the very few visitors who were able to recognise an ore by sight, and judge of its value. The collection, nevertheless, included a large number of metalliferous ores of fair quality, the principal of them being red hematite, in fine kidney-shaped nodules; lead ores, accompanied by metallic lead, obtained from them and copper pyrites, which would have given a very fair percentage of the metal. There were also many specimens of coal, and as it was estimated that the several districts from which they were derived included a range of upwards of 40 leagues along the Black Sea, the Sea of Marmora, and the Archipelago, great expectations were entertained of the mineral industry of Turkey becoming important, in aiding the progress of the empire, but it is manifest that a considerable period must still elapse before Turkey can become at all a desirable field for the employment of English capital in the development of mining enterprise.

The attempt to introduce the Mining Company of Thessaly upon the English market will be fresh in the recollection of all, from the great extent of the concession—the whole of Thessaly and part of Lower Albania and Macedonia—being really extraordinary, but as remarked in the article "On the Mineral Wealth of Turkey," published in the Journal of Sept. 10, the obstacles are so various and radical that there is little prospect of their being satisfactorily overcome, whilst the character of the people, and the illiberality of the mining laws, are such that to invest money in Turkish mines would ensure even greater certainty of loss than similar investments in either Germany or South America. The terms upon which Turkish concessions are granted are such that no capitalists of ordinary commercial sagacity would touch them, the enactments being apparently framed to prevent the possibility of the return of any portion of the capital embarked, whether the mines prove valuable or otherwise, as will be seen from the subjoined abstract of the regulations which have been in force since the 9 Mouharrem, 1278 (about June or July, 1861), and to which persons mining in Turkey have to submit:—

Preamble.—Gold, silver, platinum, lead, copper, tin, iron, zinc, mercury, manganese, arsenic, orpiment, chrome, cobalt, nickel, sulphur, coal, rock salt, alum, emery, and all other substances of a similar nature, are regarded as minerals, but marble employed for building, and other similar purposes, granite, koufeki, flint, gypsum, lime, paving-stones, kaolin, sand, clay, pottery-clay, and earthy and stoney substances in general, do not come within that category. The extraction and treatment of mineral substances cannot be carried on without an imperial *iradé*. A special Board of Mines will henceforth take cognizance of all questions relative to the mineral substances above enumerated.

Section I.—On Seeking for Mines.—1. Every landowner may dig and delve as he likes in his own property, with a view to find mineral substances, without any official authority.—2. Explorations upon the property of another person, who does not work his minerals, can only be undertaken with the special license of the Board of Mines.—3. Explorations upon the free Crown lands (erazii miriyé) require a similar license.—4. When it is desired to work upon or under parts of a town, village, or pasturage, forest, market-place, or other public place, the license will not be granted until it has been proved that the opening of the mine will not prejudicially affect the inhabitants of the neighbourhood.—5. The license is obtained by petition to the Board of Mines, and such petition must define the exact locality where the explorations are to be carried on, stating the province and *caza* in which it is situated, the surname and forename of the proprietor, the nature of the mineral to be sought, and an engagement to give compensation for damages occasioned. The authorities will then consult the engineer for the district as to the probability of success, and the system of working which should be adopted, the amount of indemnity to be claimed by the proprietor being settled by experts. The engineer will also make his own remarks upon the project.—6. The exploration must take place within two years from the date of the license, but the time may be extended if the Board of Mines thinks fit.—7. If the exploratory works are not commenced within three months, or if the works be not carried on continuously, the license may be revoked, and granted to another.—8. Mining works cannot be carried on within 150 archines of any walled-in property without the consent of the proprietor.—9. A proprietor who explores in his own right upon his own property is bound to obtain a concession before undertaking regular works.—10. The concession of a mine will be granted to the discoverer under the 12th clause.—11. Two licenses will not be granted at the same time for the same property.

Section II.—On the Working of Mines.—12. Previous to the grant of a concession evidence must be given that the works will be profitable; that the working of the mine will not prejudice any mine or smelting works in the neighbourhood; that the works shall be conducted upon the most approved system; and that those asking for the concession possess sufficient capital.—13. The concession will be granted for a fixed term of years, according to circumstances, to subjects of the Porte, individually or associated, but foreign subjects may become shareholders in the companies formed.—14. The society or individual undertaking to work a mine will have to guarantee the proper conduct of the works, and the continuous working, and to satisfy the conditions of the concession.—15. The concessionaire will have to give security for the payment of indemnity for damage of property above or in the immediate neighbourhood of mines. Disputes upon this point will be dealt with by the Imperial Board of Mines.—16. The Board of Mines will decide to whom the concession shall be granted, but if it be not granted to the person who has, under license, made the discovery, he will be entitled to indemnification, which will be named in the firman granting the concession.—17. The petition must contain the names, forenames, professions, and addresses, and the situation of the mines, the extent of the concession demanded, and the nature of the mineral to be extracted, the state in which the products are to be brought into the market; the wood, coal, or other fuel that will be necessary, the indemnity payable to the proprietor and to the discoverer, and there must be a plan accompanying showing the limits and mode in which the mineral is deposited.—18. The application will be registered and the necessary enquiries will be made within six months, after which the firman granting the concession will be issued.—19. Oppositions will be received during the said six months.—20. Those opposing will be afforded all necessary information by the Board of Mines.—21. A concessionnaire may take up several mines at once upon giving proportional guarantee.—22. In case of a mineral not named in the concession being discovered, it cannot be worked without a supplementary concession.—23. In case of temporary workings, which permit of the surface being restored to its normal condition within one year, the miners are to pay the proprietors an indemnity equal to double the estimated produce for the year, such indemnity not to include the cost of restoring the land to its original condition.—24. When the working of one mine interferes with that of another mine the indemnity must be arranged between the concessionnaires.—25. The mining engineers will exercise a surveillance for the protection, and will watch over, together with the governor of the province, the workmen taken from among the population, who must be fairly dealt with, and receive equitable wages, and will see that they are not exposed unjustly to any violence or molestation.—26. They will look into the mode of working, and report defects to the governor of the province, or Board of Mines, as soon as possible.—27. When the workings of a mine shall have been suspended or abandoned, as also in case of any failure of the supply to the metal workers, the engineer and the governor must at once report to the Board of Mines.—28. Disputes between the concessionnaire and the administration as to contraventions of usages and regulations, or as to the concession itself, will be heard before the Imperial Board of Mines. Civil disputes will be settled by the district council, in presence of the engineer.—29. If the works compromise public security they may be suspended, unless the evil be remedied.—30. The concessionnaire must each year furnish to the district engineer a plan and section of the mine, and a sketch of the work proposed to be carried on.—31. In case of abandonment becoming necessary the plans and sections up to the day of abandonment must be recorded.

Section III.—Of the Charges Payable to the State.—32. The concessionnaires will be bound to pay a tax or royalty to the Government upon all ore raised, the rate to be mutually agreed upon according to the richness of the minerals. This tax will be defined in the concession, and the Board of Mines will decide whether it shall be in money or in kind.—33. For mines conceded by firman upon the Imperial lands there will be a fixed annual tax of one piastre per donoum of 1600 square architectural archimes.—34. Fees amounting to from 1000 to 1500 piastres will be payable upon the delivery of the firman.—35. The works must be commenced within one year.—36. The concessionnaire must indemnify the proprietors for damage done to their land. At the expiration of the concession a new concession may be granted to anyone, but, the conditions being equal, the original concessionnaire will have the preference. In all cases a new firman will be necessary.—38. The concessionnaires cannot take in partners to obtain additional funds without the authority of the Board of Mines.—39. At the expiration of the concession the mine, as well as the fixtures attached thereto, will remain the property of the State. The concessionnaire may sell the movable plant, unless the State elects to take it at a valuation.—40. In case of abandonment before the expiration of the term of the concession, whatever may be the cause, the mine and fixtures revert to the State without indemnity. It will be the same if the mine be abandoned through the mineral being exhausted, if the abandonment take place after three-fourths of the concession has run. If only half the term shall have expired, the fixtures will be valued, and the total will be equally distributed over each year of the entire duration of the concession, and the concessionnaire will be entitled to them when he shall have paid to the State the sum proportioned to the number of years which have to run. If less than half the term shall have run previous to abandonment the fixtures will be his, free of any claim by the state.—41. The term "fixtures" comprises besides the pits, galleries, and excavations, the buildings, steam or other engines, and similar fixtures, the implements used in the mine, or for the carriage and dressing of the ores, as well as the animals employed in the mine, but ore raised and materials will not be regarded as fixtures.—42. At the expiration of the concession the fixtures will pass to the new concessionnaire (or to the old one if he have obtained the preference) upon payment of the value of them to the treasury.

Section IV.—Of Forges and Smelting-Works.—43. No smelting-work, or other arrangement for reducing the ore, can be erected without the special permission of the Government, given as a concession similar to

those for mining.—44. The concessionnaire of a mine, or other person, who desires to smelt, must present a petition to the governor of the province, stating the mineral to be treated, the form and size of the works, the place whence the mineral is derived, the quality, quantity, and source of the fuel; and if water-power is to be used, the stream from which it is to be taken. The petition must be accompanied by a plan showing the works proposed, and the water-course.—45. The petition will be handed to the mining engineer by the governor, to be reported upon. In this report the engineer will certify the correctness of the plan, and fix the amount to be paid for the permission, which will vary from 3000 to 5000 piastres.—46. The governor will then transmit the documents to the Board of Mines, with his own observations endorsed thereon.

Section V.—Duties of the Engineers of Provinces.—47. There will be forthwith appointed in Roumalia a chief engineer of mines in the provinces of Salonik, Monastir, Yanina, Bosnia, and Nishe, and in Anatolia, in the provinces of Castomonia, Angora, Smyrna, Konia, Sivas, Karpoot, and Trebizond.—48. As the formation of the corps of mining engineers progresses, engineer-adjuncts will be nominated, who may be promoted, after having for a certain time fulfilled the duties of engineer-in-chief for another province.—49. The Imperial Board of Mines will arrange the allowances, &c., of the engineers-in-chief and engineers-adjuncts, and will determine the grade which they shall occupy in the administrative hierarchy.—50. The duties of the mining engineers shall be to watch over the mining works, and see that the general law, the terms of the concession, as well as the instructions of the Imperial Board of Mines, are complied with.—51. Each year, from *Cassim* (in October) to the commencement of the April of the following year, one-half of the chief engineers of Roumalia and one-half of the chief engineers of Anatolia will sit at Constantinople, as the Imperial Board of Mines; and in the next similar period the remaining half will sit.—52. The provincial engineers sitting upon the Imperial Board will be paid the cost of returning to their districts, but their salary will be reduced one-fourth during their stay at Constantinople.—53. If an engineer be called up to the capital at other times, he will be paid his expenses for going and returning, and will continue to receive his full pay.—54. From the date of the present Act (9 Mouharrem, 1278) all previously existing mining laws are abrogated.

The permission to explore for mineral is, as will have been observed, obtainable without trouble, but, the discovery being made, no one but a subject of the Porte is entitled to a concession authorising the working of the deposit discovered, though foreigners are very kindly permitted to invest their money as shareholders in Turkish mine adventures. Whilst the mine is at work it will be subjected to the action of an immense amount of complicated Government machinery, and, as soon as the term of the concession has expired, *all the plant and machinery is forfeited to the Government*, as will be seen from clauses 39 and 41. The natural consequence of such a provision is that adventurers would be prevented from erecting valuable and efficient machinery, and that, therefore, even mines which would elsewhere return a profit could scarcely fail to result in loss. Even if the concessionnaire whose term of holding has expired is selected as the individual to whom the new firman shall be granted, he has actually to re-buy his own machinery from the Government before he can continue to use it; but there is nothing to prevent the concession being given to another, provided a few piastres more than the original concessionnaire deems it worth should be offered; so that a plant which has required much time and judgment to get together may be handed over to another, to the direct prejudice of him to whom the empire is indebted for the benefits resulting from his mining enterprise. It has been already observed that none but subjects of the Porte can become connected with Turkish mines, except as shareholders, and we have no hesitation in saying that if capitalists provide funds, either in that or any other capacity, for the development of Turkish mines, whilst the mining laws are in their present condition, they richly deserve to lose whatever money they may be thoughtless enough to invest.

The Mineral Wealth of Turkey.—An exceedingly interesting article has just appeared from the pen of Mons. E. Dalloz, on the mineral wealth of Turkey. The Ottoman empire comprises rich mineral bearings of every kind, but it is especially metalliferous minerals which abound in it. Independently of the auriferous sands over which roll the greater part of the rivers of Bulgaria, Servia, and Wallachia, explorers have found—more particularly in the Slavonic and Greek mountains—mines of iron, copper, lead, and silver; but the apathy of the Turks is proverbial, and it is in vain that Nature has thus shown herself prodigal towards them, as they work scarcely one-twentieth part of the metallic bearings which they possess, while those which have been attacked are only worked very badly. The Koran embodies a great truth when it says—"Labour, art, and industry guarantee man from necessity." But the Turks have never shown a very great readiness to obey and act on this precept of the prophet, but have rather sought to establish by the scimitar the reign of Islam. First, with regard to mineral combustible, M. Lamé-Fleury indicates the existence of important bearings of coal in Albania and the presence of lignite in Roumelia, near Rodosto, and in the Isle of Candia. The existence has been recognised, besides, of a powerful bearing of lignite at Domous-Déré, on the European shore of the Black Sea, about four leagues from its embouchure into the Bosphorus; but the richest carboniferous basin of Turkey is that of Eregli (the ancient town of Heraclea), in Asia Minor; the combustible mineral there presents itself in a state of coal. The collieries of Eregli extend along the littoral of Anatolia over a band of earth 90 miles long and 6 miles broad. There were recently in this district 40 centres of extraction in activity, employing 200 Slavonian or Croatian miners, besides several hundred men engaged in transport arrangements, &c., and producing an annual average of 200,000 tons of coal per annum. The principal working is at Zougourda, at a small distance from the sea; but as at Zougourda there is only a bad shore, which ships cannot approach in bad weather, the central depôt for combustible has been established at Eregli, situated some 25 miles more to the west. To the north-east of Servia, a Danubian province submitted to the sovereignty of the Sublime Porte, are the Dobra Collieries, on the shores of the Danube; these collieries have an extent of 14,000 acres, and have been recently conceded to the Franco-Servian Company by the Servian Government. According to a note published by this company the Dobra Collieries, the beds of which brought into working have a power of 48 in. to 60 in., furnish, at a return price of 4s. 2d. per ton, a rich long-flamed coal, capable of sustaining a comparison with the best English coal, and the extraction of which might be effected at the rate of 150 tons per day. The same note adds that the Dobra Collieries are situated so near the Danube that the first gallery opens out at a distance of 40 feet, the second at 800 feet, and the third at 1600 ft. from the river. An important quantity of English coal is imported into Turkey, the deliveries from Great Britain into the Ottoman empire in 1858 having amounted to 190,607 tons. We shall take an early opportunity of recurring to the mineral wealth which the lazy Turks either wholly neglect or are allowing foreigners to utilise. The two levers which are required to raise Turkey from her present unsatisfactory state are constitutional liberty and well-ordered enterprise. But when will the sick man ever enjoy these blessings?

Economic Treatment of Aluminium.—It has heretofore been erroneously supposed that the alkaline metals are the only reducers of the chloride of aluminium, and this supposition has contributed mainly to keep the metal at its present high price. An improved and economic process of reducing it has now been introduced by Mr. N. Basset, of Paris. All of the metalloids and the metal which form, by double decomposition, protochlorides or sesquichlorides, more fusible, or more volatile, than the double chloride of aluminium, may operate the reduction of the salt, as well as of the single chloride; thus arsenic, boron, cyanogen, zinc, antimony, mercury, and even tin, the amalgams of zinc, of antimony, and of tin, may be employed to reduce the chloride of aluminium, single or double. The author intends to apply the legal privilege accorded by his demand for a patent to this general principle, as well as to the particular application which follows. He employs zinc by preference, in consequence of its low price, of the facility of its employment, of its volatility, and of the property which it presents of metallising easily the aluminium as it is set free. When the double chloride of aluminium and zinc are submitted to a temperature of 250° to 300° Cent. there is formed chloride of zinc and free aluminium. This dissolves in the zinc in excess, and the chloride of zinc, combining with the chloride of sodium, the mass becomes little by little pasty, then solid, while the alloy remains fluid. If the temperature be raised the mass melts anew; the zinc reduces a new proportion of chloride, and the excess of zinc enriches itself proportionally. These facts constitute the basis of the following general process:—One equivalent of the chloride of aluminium is melted, and when the vapours of hydrochloric acid are dissipated, four equivalents of zinc, in grain or powder, is introduced. The zinc melts rapidly, and by agitation the mass of the chloride thickens and solidifies. This mass, composed of the chloride of aluminium, chloride of sodium, and chloride of zinc, is plied in a crucible, or in a furnace, and the fluid alloy (*Fallaiage coule*) is placed above. The heat is gradually raised to a bright red, and this temperature is maintained for an hour. The melted mass is stirred with a rake, and poured out. It is an alloy of aluminum and zinc in about equal proportions. This alloy, melted on some chloride which has been subjected to the first operation, furnishes aluminum containing only a small percentage of zinc, which disappears by a new fusion under the chloride mingled with a little fluoride, provided the temperature is raised to a white heat, and maintained till the cessation of the vapours of zinc, in the absence of air. The aluminum obtained is pure if the zinc employed contains no foreign metals. It suffices to remelt it to cast into ingots. In case the zinc contains iron, or even if the chloride of aluminum holds a portion of that metal, the metallic product of the second operation may be treated with dilute sulphuric acid. The insoluble residue is washed and melted, layer by layer, with fluoride of calcium or cryolite, and a small quantity of double chloride, destined solely to favour the fusion.—*Mining and Scientific Press.*

RESEARCHES FOR A NEW THEORY OF GEOLOGY.

"A Near Kinsman of Thomas Didymus" has just issued a curious, though not uninteresting, little pamphlet, entitled "Doubts Relative to the Epochal and Detrital Theory of Geology." The author questions "the validity of Detritus, howsoever formed, as being a sufficient means of explaining the formation of strata, and therefore of the value of stratification, as a means of determining the age of the earth, or how far we are justified in viewing it as a chronological chart." The author regards existing theories as untenable, but "himself will not venture to supply any theory." The argument, the precise line of which it is rather difficult to follow, from its want of stratification and close connection with the conglomerates, appears to be that, inasmuch as the proportions of potash, magnesia, soda, and lime differ widely in granite and in the sedimentary rocks, it would be better to regard carbonate of lime as of equal geological age with granite, and at some future time supply a theory based upon this principle. The existence of internal fire seems to be contended for, but it is assumed that this fire simply forms the envelope of an interior solid nucleus, and is itself surrounded by the solid crust of the earth. The mode in which the truth of this assumption is attempted to be shown is undoubtedly ingenious, and appears to be open to only one objection—that there is no connection whatever between the demonstration and that which is to be demonstrated. Thus, it is assumed that if an equilateral triangle be inscribed by a circle equal to the earth's circumference, and force be acting equally in all directions, there being no central nucleus, all mountains would have a base not much wider than the base of an equilateral triangle. Taking this assumption as a postulate, the truth of the author's arguments is proved with the greatest facility. If the central nucleus were a point, all the mountains on the earth would have the form of long cylinders; they would be without even the ordinary taper of a 60-foot flagstaff. As our mountains are not like flagstaffs, we have only to assume the nucleus to be larger and larger, until the base of the triangle becomes large enough to give sides corresponding with the average of the mountains.

Upon the assumption that granite and limestone are of equal geological age, that the earth is a hollow sphere lined with fire and containing a solid globe within, and that according to existing theories all mountains should have bases not greater than equilateral triangles, the author supplies us with his own theory of the forces of Nature which tended to establish that order of stratification now found in the geological chart of rocks. He remarks that "The attention is first arrested by the fact that different epochs or intervals of stratification are marked by more violent forces of elevation, acting powerfully and somewhat more adruptly at one period, and more gradually and continuously during the intermediate periods, as at the present time in Scandinavia, along the coast of the Mediterranean; and in the Pacific along the coast of South America, where elevations or dopressions are going on slowly but constantly, and in many other parts. After the formation of the metamorphic rocks, the elevating forces first appear to have broken through the Silurian and Devonian systems in great violence, and to have considerably elevated the submerged rocks, fracturing and dislocating them in bold and unequal proportions; whilst from thence till the Permian system was formed, the same work of increasing elevation of the land was going on, but in a more gradual and regular manner. After the Permian system was finished, Nature roused up her semi-quiescent forces into more powerful operation, and the Triassic system abounds in bold and rugged mountain scenery, with adrupt fractures and mountain elevations, the evident result of internal forces expanding and raising the crust of the globe above its former level most extensively and violently. From this period till the completion of the Cretaceous system, the same forces, acting more equally and regularly, were increasing the general area of the land above that of the water; and after this system was nearly completed, the tertiary rocks were ushered in by a general and violent action of forces which had been long at work as slow and almost, at parts, imperceptible elevating forces, but were now put forth in all their plenitude and grandeur, as the lofty summits of the Alps, the Pyrenees, and the Andes, with many others, significantly attest; and by such process of elevation, in a short period, the relations between land and sea approximately assimilated themselves to those pertaining to the historic era of man. Thus from the Silurian to the Permian, and from the Permian to the Cretaceous or lower Tertiary, the land has been continually gaining in area at the expense of the sea, and the Fauna and Flora have become more terraceous in their structure and habits, and their organization has more and more rapidly assimilated itself to the necessities and conditions of land habitation. With this increasing elevation of the land, rivers and fresh-water lakes became more common and extensive; animals of a higher order became more general; whilst the Flora of the Tertiary series exhibited in elegant contrast the trees and plants of tropical with those of more temperate regions, the soil being carpeted with mosses and grasses analogous to those now existing, where the exogenous and nedogenous growths blend and contrast with each other, and frequently succumb and rot through the officious attachment of their less honoured but more tenaciously vital neighbours, the cellularies and their allies. From, therefore, the foregoing review of the effects of the elevating forces, and the onward progress in the Floral and Faunal development, it may be inferred that, at least in the laws of Nature or of physics generally, the Tertiary formation assimilated itself in every respect to those laws now binding and governing the structure and mechanism of organic and inorganic matter."

The pamphlet will form a worthy companion to the proposed "Geological Notes and Queries," both of which will, undoubtedly, be useful in proving how little is known of the subject referred to, and how large a field there is for the researches of the industrious and enthusiastic geologist.

THE SIMPLICITY OF THE CREATION.

The second edition, which has been so materially enlarged as to be fully twice the size of the first, of Mr. W. Adolph's description of his new theory of the solar system, thunderstorms, waterspouts, aurora borealis, &c., and the tides*, has just been issued, and we are quite willing to admit that the work is very carefully and ably written, although not strictly in accordance with the opinions usually regarded as orthodox by those acquainted with the science treated of. Mr. Adolph alludes, though not with sorrow, to the fact that his theory was not taken up by the astronomical world, but he now submits it where it is likely to receive a far more encouraging reception—to the Divine Authority of the Holy Catholic Church. It cannot be denied that at the present time men of science are not contented with anything short of practical facts, and that even in connection with so divine a science as astronomy they will not forego the smallest portion of their demand for facts, whatever may be the amount of genuine and praiseworthy religious feeling offered as a substitute. The entire work displays a large amount of reading and research, and although the authorities quoted—Von Gumpach, Mackintosh, &c.—are not such as would be generally received as indisputable, they are, nevertheless, such as fully bear out his arguments. Regarding the work as entirely of a scientific character, we shall endeavour to give in as brief a manner as possible a sketch of some few of the opinions which it contains. In the first place, with regard to the creation, Mr. Adolph maintains that God created material causes—instruments to produce effects; but that he did not create effects, or abstract self-acting forces, whether these forces be centripetal or centrifugal, attractive or repulsive, moving or reposing. When suns had been lighted positive electricity filled the universe. Beyond this universal sphere of electricity is eternal darkness, and there God is "holding creation upon his hand, and turning it round without effort, and within this moving creation travelling through eternity all the heavenly systems are harmoniously revolving, most likely round a centre of their own, perhaps round our own solar system. To each of these systems, repelling each other like so many electrified pith balls," the Creater gave a sun as a centre of light and warmth, and as a point of attraction. To explain that the moon does not make one rotation on her axis during her monthly course occupies a chapter, and this explanation being given, the author proceeds to the tides. Mr. Adolph considers it is clear that the moon passing along the ecliptic (floating on one of the oceans of air by which the earth is encircled, not like a revolving wheel, but like a well-laden ship on the sea) by her mediate pressure upon the water drives the tide down towards the poles, and that the second tide within 24 hours is but a reaction of the first one actually caused by the moon. Mr. Adolph alludes to the fact that he is but an amateur in connection with Natural Philosophy, and it is to be hoped that his book will be thoroughly and carefully read by the scientific, that the erroneous statements may be pointed out to their students.

* "The Simplicity of the Creation; or The Astronomical Monument of the Blessed Virgin," &c. By William Adolph. London: Burns and Lambert.

Natural Ventilation Interpreted and Practically Applied.—A concise little paper upon this subject has just been issued by Mr. Thos. Boyle. The writer proposes that the ventilation shall be conducted by introducing the cold air at the floor, and permitting it to escape near the upper part of the chamber, instead of the more natural system of admitting the cold air near the ceiling, and letting it percolate through the lighter warm air, which it is desired to remove. Of course, Mr. Boyle's system is well calculated to display the skill of the fitter in a manner which the natural system would leave no room for. The theory of Mr. Boyle's proposition is readily understood—the cold air entering at the bottom, and a free outlet for the warm being provided at the top of the chamber, the change of air is effected more rapidly than when the cold air has to pass through the warm, but against this there is the fact that the draught which is inevitable when the cold current is introduced at the floor is entirely avoided when it is introduced at the top.

An Electric Telegraph without Wires.—Experiments are now in progress, both at Mont Valerien and Vincennes (says *Galignani*), for the purpose of testing a new system of electric telegraphy invented by M. Armant Douat, who, it is said, has found means to do away with electric wires altogether, and transmit despatches by the sole action of the earth. A zinc and a copper plate, bent in spindle-like shape, are buried in the ground, with their convexity turned in the direction in which the despatch is to be sent. If there be anything in this, it certainly excels the Dundee electro-telegrapher (now deceased), who sent messages across Portsmouth harbour without any crossing wire, but by means of wires and plates on either side, extending at right angles to the line of direction across the harbour. This gentleman (Mr. Lindsay, if we mistake not) was confident that merely by means of plates with wires extending for many miles on either side, a transatlantic telegraph might be made.

Electric Light.—At Lorient, during some experiments with the electric light, a signal mast was fixed at 700 yards, and at 500 yards from two ships, when the signals given by flags from the summit of the mast were rendered perfectly visible on board by means of the electric light. A third experiment caused great suprise and admiration. A diver descended 20 feet under water, and by means of the light was enabled to distinguish the decimal divisions on a scale which was sent down to him, and to give proofs of it. This experiment was deemed conclusive. It is now established that an electro-magnetic machine may be permanently fixed to light large workshops, sub-marine works, and narrow passages into harbours. It was further observed that when the light was brought to bear on the water, shoals of fish were attracted by the unusual appearance, and continued to swim round the part lighted. Eels and other fish which were at the bottom of the sea came up to the surface.

New Alloy for Bells.—M. M. M. H. Micolon has just patented a new alloy suitable for numerous articles, such as bells, hammers, anvils, and other non-cutting instruments. The alloy consists of iron, manganese and borax. The proportions given in the specification are:—20 parts of iron turnings or tin scraps; 80 parts of steel, 4 parts of manganese and 4 parts borax. But it states that these proportions may be varied. If it is desired to augment the tenacity of this alloy, two or three parts of wolfram (Franklinite) may be added. The iron and steel are placed first in a crucible, afterwards the manganese and borax, and the crucible is then filled with charcoal. It must be poured rapidly into the molds. Bells are thus obtained possessing the sonorousness of silver and costing less than bronze.

Wheal Penrose Lead Mines.—One of the excursions made by the Miners' Association of Cornwall and Devon was to the Penrose Lead Mines, to the formation of a company for working which we alluded a short time since. From Helston to Penrose the road passes down to the valley of the Looe river till its junction with the lake, over an alluvial deposit, consisting at the surface of sand, and at greater depths of vegetable matter, alternating with gravel covering, at a depth of about 30 ft., some tin-stream ground. At the head of the lake is the old Wheal Pool lead mine, formerly very rich. The line of the shafts bears nearly north-west and south-east, and the lode is said to be a continuation of a large cross-course, traceable as far as Hayle, and seen in the excavation of the turnpike-road between Helston and Breage. Passing through the grounds of Penrose Mansion, traces of the proximity of mining operations are evident, until at Higher Penrose farm the hedges are in great part seen to be composed of stones of elvan and mine refuse, among which lode-stones of massive and crystallised quartz, containing carbonate and oxide of iron, sulphide of lead, and occasionally copper pyrites are abundant. A little beyond the extensive workings of Wheal Penrose and Wheal Rose are reached, in the old heaps of which rich and interesting specimens lie thick. In the former mine, now being wrought by Mr. Hunt, of Porthleven, the rich and delicate looking yellow and green crystals of arseniate and phosphate of lead are most remarkable; next, the large white needle-shaped fasicles of carbonate of lead, coating the massive blocks of sulphide of lead and quartz. Lately some fine transparent crystals of sulphate of lead have been discovered by Mr. Hunt, which, adhering to the black velvetty surface of iron hematite ore, have a peculiar lustrous appearance. On the adjoining mine, Wheal Rose, are large quantities of carbonate of iron, for which at present the mine is principally worked above the adit level. In these ores some very clear perfect crystals of quartz were found by members of the class. These mines are said to have been worked from a remote period—as far back as the Roman occupation. In the eighteenth century they were held on lease by the Godolphin family, and have at intervals been exceedingly rich. The lodes run nearly north and south magnetic, and are parallel to the ridge of the hill in which they are contained. In the cliff below the mines the clay-slate alternates from a blue to an olive green colour, the former being the productive rock; the cleavage planes are 35° east of north and north and south, the latter, which are nearly parallel to the lodes, frequently contain veins of massive quartz. About midway between the Looe bar and Porthleven is a lode about 12 feet wide, bearing 30° north of east, and underlying 25° south of east, exhibiting a fine gossan; and about 50 fathoms further towards Porthleven the Wheal Penrose lode is also seen. Directly under the workings of Wheal Penrose is a large lode, running about east and west, from which at low tides sulphide of lead may be broken, and occasionally on the beach rounded pebbles of massive carbonate of lead have been picked up—some of these are still in the possession of Mr. Hunt. The whole of the rocks in this vicinity contain lead veins, and it is not improbable that it may again resume its place as the greatest lead-producing district of the county of Cornwall.

The Hot Springs of Cornwall.—The observations of Sir Charles Lyell with reference to the Hot Springs of Cornwall leading to the supposition that they had only recently been noticed, excited some little feeling on the part of those who had previously directed attention to them, but the prompt, ample, and very handsome manner in which he acknowledged that he had been inadvertently led into error is considered as a thorough compensation. Sir Charles took the opportunity of publicly correcting his error before the meeting of the British Association had separated, remarking that he wished to lose no time in communicating to the section a letter which he had received from Mr. Henwood, whose important work on Mineral Veins, and other valuable publications on geology and mining, are so well known. He continued—"Mr. Henwood has pointed out a great oversight, which I inadvertently made when I stated in my inaugural address that we had no published scientific account of the Wheal Clifford hot spring, near Redruth, in Cornwall. I was first informed of the existence of this spring by Dr. Percy, of the Royal School of Mines. He referred me to Mr. Warington Smyth, the result of whose two visits to Redruth, and whose observations on the springs in 1855 and in 1864, I have referred to in my address. Unable to learn from these gentlemen, or from my friend, Dr. Daubeny, that any account had been printed of this hot lode, I wrote to Mr Horton Davy, who was unable to obtain for me, after speaking to the miners at Redruth, any reference to any published data on the subject. I now find that so long ago as the year 1819, in the reports of this association, Mr. Fox has given notice of the temperature (76° Fahrenheit) of the water when the river was 170 fms. deep, and that subsequent observations by him, Mr Henwood, and Mr. Francis, between the years 1838 and 1857, had been published in the Cornwall Geological Transactions, and in our own British Association Reports, closing with a notice by Mr. Fox of the temperature reaching 116° Fahrenheit, at the depth of 255 fathoms, in the year 1857. Mr. Fox had detected the chlorides of calcium and sodium, but it remained for Prof. Miller to descover laesium, and that large and extraordinary amount of lithium which gives to the solid contents of this spring its peculiar and unique character. I feel sure that Mr, Henwood and Mr. Fox, for both of whom I have always entertained the highest regard, and the reliability of whose observations I have ever appreciated, having frequently had to cite them in my works, will do me the justice of believing I regret extremely, on more grounds than one, that my attention was not directed to their printed reports on this Cornish spring, inasmuch as they would have enabled me to compare the former and present condition of the spring at various depths. At the same time I am not aware, at present, that any of the conclusions to which I have arrived from the data furnished to me would have differed essentially, even had I profited, as I could have wished, by their previous labours. I am also informed by Prof. Phillips, that in his presidential address to the Geological Society of London four years ago he alluded to this Cornish spring."—Mr. Pengelly, one of the secretaries of the section, then read a synopsis which had been communicated by Mr. Henwood, on "Observations on the Warm Springs of the United Mines, from 1819 to 1857," from which it appeared that the temperature varied from 67° Fahrenheit at a depth of 170 fathoms to 116° at 255 fathoms.

The New Light.—One of the most attractive, if not the most scientific, features of the British Association meeting was the lecture on Light, by Prof. Roscoe, in the course of which he exhibited the magnesium light. The light emitted by burning magnesium wire is exceedingly rich in chemical rays, so much so that it may be used instead of sunlight for the purposes of photography. As an illustration, a photograph of Sir Charles Lyell was taken and shown upon the screen. The spectrum of burning magnesium is exceedingly rich in violet and ultra-violet rays, partly due to the intensely heated magnesia formed by the combustion. The chemically active power of the magnesium light was determined some five years since, and its use for photographic purposes proposed. It was shown that a burning surface of magnesium wire, which, seen from a point at the sea level, has an apparent magnitude equal to that of the sun, effects on that point the same amount of chemical action as the sun would do if shining from a cloudless sky at a height of 90° 53′ above the horizon. On comparing the visible brightness of these two sources of light, it was found that the brightness of the sun's disc, as measured by the eye, is 524 times as great as that of burning magnesium when the sun's zenith distance is 67° 22′, whilst at the same zenith distance the sun's chemical brightness is only five times as great. Hence the value of this light as a source of the chemically active rays for photographic purposes becomes at once apparent. In the memoirs published in the above year, it is stated that the steady and equable light evolved by magnesium wire burning in the air, and the immense chemical action thus produced, render this source of light valuable as a simple means of obtaining a given quantity of chemical illumination, and that the combustion of this metal constitutes as definite and simple a source of light for the purposes of photo-chemical measurement, that the wide distribution of magnesium becomes desirable. The application of this metal as a source of light may become even of technical importance. A burning magnesium wire of the thickness of 0·297 millimetre evolves as much light as 74 stearine candles, of which five go to the pound. If this light lasted one minute, 0·987 metre of wire, weighing 0·120 grammes, would be burnt. In order to produce a light equal to 74 stearine candles burning for 10 hours, whereby about 20 lbs. of stearine is consumed, 72·2 grammes (2½ ozs.) of magnesium would be required. The magnesium wire can be easily prepared by forcing out the metal from a heated steel press, having a fine opening at bottom; this wire might be rolled up in coils upon a spindle, which could be made to revolve by clock work, and thus the end of the wire, guided by passing through a groove or between rollers, could be continually pushed forward into a gas or spirit lamp flame, in which it would burn. The manufacture of this metal is now carried on under Mr. Sonstadt's patent, by the Magnesium Metal Company of Manchester, and the light evolved by the burning wire is likely to be applied to very many technical purposes. It appears that the Manchester company has received an application from the managers of the gasworks at Rio de Janeiro, who seem to think it would be better for them there to light with magnesium wire than with gas; Prof. Roscoe believed it was a serious proposal, but scarcely expected such an idea would be carried out in practice.

New Quartz-Mill in Nevada.—We were yesterday shown the mode of a novel and most ingeniously-arranged quartz-mill. The model is one-twelfth the size of the working machine, and is very neatly constructed. The machine of a size for actual working of ores will be 22 ft. in diameter and 24 ft. high, circular in form. It is calculated to be driven by horses, and the inventor claims that two horses will be able to run 30 stamps with ease, though this is but one-fourth the number of stamps calculated to be placed in the complete machine. There will be 120 stamps, each weighing 300 lbs., standing in a circle around the circumference of the main driving-wheel, which is 22 ft. in diameter. Fixed upon the circumference of this huge wheel are inclined planes filled with friction-wheels, by means of which the stamps are lifted. When all the stamps are going, eight fall every second. The mill can be started with 10 or 15 stamps, and others be added as they may be required. Eight horses will run the whole 120 stamps, and drive the whole of the amalgamating machinery, which is inside of the circle of stamps and below them. The amalgamating machinery is unlike any in use in the territory, or in the world. We know of no way to explain it in words. We may say, however, that the pulp is stirred by agitators fastened upon the same wheel that drives the stamps. There is absolutely no machinery about the whole mill. Nothing but an upright shaft with a large wheel on it, just like a common whim. It is upon the top of this wheel, which is well represented by the drum of a whim, that the inclines are placed which lift the stamps. The crushing part is like a Howland rotary battery on a huge scale. We were also shown by Mr. Wilkins the model of a most ingenious furnace, or rather furnace and steam-boiler. The furnace is for roasting ores preparatory to crushing. It is upright, standing 16 ft. high, and is 8 ft. in diameter at the bottom and 6 ft. at the top. The same fire which roasts the ore generates the steam in the boiler, for the boiler surrounds the roasting furnace, there being a space of 2 ft. on all sides for the water. Mr. Wilkins says a boiler of the size mentioned above will generate sufficient steam to drive a 40-horse engine. It is a most ingeniously-contrived affair, and, besides roasting ore and generating steam, does all the retorting, and condenses and saves all the sublimated metals escaping from the furnace.—*Territorial Enterprise*, July 30.

An ingenious Englishman was permitted to try some experiments at the gas works at Malines last week, the most successful of which was the sudden appearance throughout the city of a beautiful clear red light, which threw around rays of the most brilliant description. It is said that by the addition to the gasometer of some chemical salts, an increase of light and changes of colour can be instaneously produced.

Plaster of Paris for Paint.—It has been proposed to use ground gypsum instead of white lead as paint for outside work. It is said to be equally or more durable than white lead or zinc white, and deserves to be widely known, as the plaster is very cheap and easily obtained. Take equal parts of plaster and white lead, with oil enough to make it the consistency of cream, and run it through a paint mill. This will have a good body, and very serviceable. For painting the roof of buildings, the plaster and oil answer a good purpose, and it is durable, and when rain water is collected in

cisterns, it will be found to be purer than when it comes in contact with lead. Plaster in sometimes found ground very coarse, and it should, therefore, be run through a paint mill before it is used.

Meetings of Mining Companies.

TIN HILL MINING COMPANY.

A general meeting of shareholders was held at the offices of the company, Plymouth, on Monday,—Mr. C. Gibson in the chair.

A statement of accounts from Dec. 1, 1863, ending with the costs, including everything to end of August, was submitted, showing mine cost and merchants' bills, engine and boiler, 724*l.* 4s. 4d.; call received, 350*l.*—showing a debit balance (Sept. 1) of 374*l.* 4s. 4d. A call of 5s. per share was made. The report of the agent was read as follows:—

Sept. 24.—The lodes in this sett are numerous, some of them having been worked up by the ancients to a great extent: these lodes, with our own discoveries, number eight, all proved to yield tin in quantity and quality as will realise the first price in the market. This property has been from time to time much sought after, and parties of small means have worked upon some of the lodes, and have all made some profitable returns of tin ore, but having no machinery, directly they sunk to take the water off the country, they were stopped: the ancients could not develope their works for the same reason. For the last 100 years the property was held by the families of Tretheway and Arthur, who obtained their living from the returns of tin made from these lodes. Of late years it has changed hands, and, as a mineral property, for a large sum of money. The present company have possessed themselves of a most valuable piece of mineral ground, which will soon show itself when the engine is in course to command the water, to enable the sinking of the shafts, and driving deeper levels to intersect the lodes under the ancient workings; then any number of tributers may be employed as these levels extend, thus proving this mine of less speculative character than new undertakings in general; and the extensive workings done previous to the holding of the present company are of considerable value, for their levels will be available and necessary in the continued works of the mine. We have since last meeting sunk and cleared down 10 shafts upon the various lodes, and intersected by levels the caunter lodes; also erected smith's shop, &c., and are fast completing the engine and botler-house—the engine and necessary connections are all on the mine; we have completed the dressing-floors, erected the water-wheel and machinery, and have a plentiful supply of water, giving ample power for working 16 heads of stamps, 8 heads being completed and at work, having stamped 400 to 500 sacks of tinstuff, which, when dressed up, I compute will produce 1 ton of tin, and have at present tin work raised upon the surface sufficient to produce 2 tons more. This tinstuff has been obtained out of the backs of the lodes and arches left by the ancients in their levels; and from the proof here showing that upon the engine having command over the water in the mine, many runs in these rich tin lodes can be set on tribute, at the low price of 5s. in 1*l.* Nos. 1, 2, and 4 lodes we have sunk about 8 fathoms upon, and find them varying in size from 3 to 4 feet wide, and worth for tin 2 to 3½ cwts. of tin to the 100 sacks of the lode stuff. Dale's lode, worked much upon, over a long run of ground, to the depth of 9 fathoms (the water level); and judging from the tinstuff taken from the arches it is worth 4 cwts. to the 100 sacks. No. 3 lode we have worked upon, and cleared up the old men's level for 40 fathoms, and in this space find the change of strata, the western part being in the light growan granite, changing in the east to a beautifully mineralised killas; this lode is found to be worked away 4 to 5 ft. wide, down to the water, and from portions of the lode met with it appears to be very rich for tin. Arthur's lode is found to be worked away (6 feet wide) east and west, by the old men, over a long run, leaving occasionally an arch of the lode to support the ground, and is equally as rich for tin as the others. All these lodes are running parallel 5° south of east. Tretheway's lode is a caunter intersecting these lodes, near our engine-shaft, and we are informed by the old miners of the district that there are three caunter lodes in the sett. The quarry lode we have recently discovered in raising the building stone for our engine-house, is producing some good stones of tin ore, but we have not opened it out sufficient to get its bearings. This week we sunk 16 ft. upon it, and cut the lode 18 in. wide, very rich for tin—yielding 8 cwts. to the 100 sacks; this is a most promising lode, and it is the intention at once to commence and carry down a shaft 12 fathoms, and cut it in its underlie again, when we fully expect to find the lode to open out larger, and equally as rich for tin. If the weather continues favourable the engine-house will be completed by another fortnight, so as to be ready for slating in, and within six weeks to have the engine up and at work; then, with energy and economy, we shall be able to show in a short time one of the best tin mines in the district, and yielding large profits, as the ground is easy for sinking and driving on the junction of the killas and granite. The railway now carrying out will pass through this sett; the cutting required for it we expect will discover and open out more lodes equally as valuable. All these advantages induce me to congratulate the adventurers upon the apparent certainty of success, for with the small additional outlays required in the completing and getting the engine in working order, and sinking and driving the necessary few fathoms more, they will make this an extensive and returning property.—John Martyn.

Mr. Jennings made enquiries of the agent as to the new discovery of the Quarry lode, and the extent of the sett; he informed him it was a very large one, the lodes running right through the sett for 400 fms. or more; that the Quarry lode mentioned in his report was a most important discovery, as it was whole to surface, being to the north of the old men's workings, and proved by the stones he produced at the meeting what rich tinstuff must have been taken from the other parallel lodes.

The Chairman having moved that the report should be entered on the minutes, and that the accounts should be passed and allowed, stated, from the information he had obtained, that as soon as the engine could be got to work Tin Hill Mine would soon make large returns, having so many valuable lodes in the sett, all productive for tin, and that by prosecuting the development of the mine with spirit success would be realised. He had a strong opinion that by the next meeting the concern would be placed in a good position, with a balance in our favour. A little more outlay, he thought, would do all that was required to place it in a paying condition.

The Purser considered the agent's report highly satisfactory, and believed, with the cordial assistance of the shareholders, the property, from the rapid progress already made, in a short period would rank amongst the first in the county for its returns of tin; the quality was of the best description, not requiring to be calcined, merely stamped and dressed. In a few weeks they expect the engine to command the water, when a large space of tribute ground will be available to be set at a good profit to the adventurers. Had any adit level of the ancients been discovered, so as to drain the mine, returns might have been made ere this; it became, therefore, necessary without delay to erect machinery to enable them to follow the rich lodes going down in each of the various levels. The whole of the costs are paid up and charged to the 31st of August inclusive; great economy had been exercised, and by paying cash at the end of every month for everything supplied in that month, they have been enabled to work the mine at a cheap rate. The engine and boiler was purchased for the same reason—a great bargain—and is suitable in every respect for the wants for years. He was in hopes that it would soon enable them to pay dividends, and after this meeting no further calls would be needed. It was his wish to push forward the works with vigour, that their returns of tin should be large and continuous. One great object is now to complete, with all speed, the engine and boiler-house, and get it to work to realise the splendid prospects shown by the workings of the present company to exist in this mine—a property of the most satisfactory progressive character.

The report was ordered to be entered on the minutes, and the accounts passed and allowed. Thanks were voted to the Chairman, who in acknowledging the compliment terminated the proceedings.

CARADON CONSOLS MINING COMPANY.

A general meeting of shareholders was held at the offices of the company, Winchester-buildings, on Sept. 21.—Mr. Buckland in the chair.

Mr. E. King (the secretary) read the notice convening the meeting, and the minutes of the last were confirmed.

A statement of accounts for the three months ending with cost for July was submitted, which showed a balance in favour of the mine of 64*l.* 12s. 1d.

A call of 10s. per share was made.

The following special reports, together with the report of the agent, were submitted:—

Sept. 15.—I have carefully inspected this mine to-day. The engine-shaft is sunk 80 fms. below the surface, 70 fathoms of which is on the course of the lode, underlying north about 3 ft. in a fathom. Present operations are being confined to the bottom, or 80 fm. level, which are extended on the course of the engine lode 42 fathoms; the west drivage being 22 fms., and the east 20 fms. In the course of this drivage the lode is found to vary in size from 9 in. to 2½ ft. wide, in places producing good stones of ore; the lode in both ends is unproductive. About 13 fms. east from engine-shaft a winze is being sunk on the course of the engine lode, which is now down below the level about 3 fms., where the lode is 2½ ft. wide, being principally composed of fluor-spar, capel, spotted with mundic and ore. In this level a cross-cut is driven on the cross-course north 30 fms., and intersected the north lode, which is laid open east of cross-course 6 fms., and west 30 fms. About 12 fms. or 15 fms. of this drivage, to the west of cross-course, the lode shows a very kindly appearance, and much improved in character from that seen in the levels above; the lode in both ends is poor. The south cross-cut is driven 85 fms. on the cross-course, in which three lodes have been discovered, all of which has been laid open some short distance, but found to decline its general appearance as the drivage is extended, either east or west from the cross-course. In looking over the whole in connection with the present position and prospects of this mine, and to avoid any unnecessary expenditure, I think it is advisable first to consider the best and most economical means to see those lodes at a deeper point, and particularly in such places where an improvement is most likely to be effected in the shortest time, which, I believe, is in strict conformity with the views entertained by your agent at the mine. To confine the operations of the mine to the three following points:—Continue the sinking of the trial winze on the engine lode; also sink a trial winze on the most productive part of the north lode, and should there be a sufficient improvement to warrant the sinking of the engine-shaft, it can hereafter be accomplished, and both winzes made available for ventilation, &c. Meantime, continue the south cross-cut with as many hands as can be advantageously employed therein, as there are many known lodes in this direction, in which some important discovery may be made at any time. This should be regarded as a very important point of interest, which may very possibly lead to satisfactory results.—George Rowe.

Sept. 14.—In accordance with your request, I have this day carefully inspected the above mine, and beg to hand you my remarks thereon. The engine-shaft is sunk from surface to the 80, on the engine lode, in close connection with the cross-course, consequently the lode has not been in a settled state, and the sinking of the shaft has been suspended for the present. The 80 is driven east of cross-cut on this lode about 20 fms.; throughout this drivage the lode will average about 2 ft. wide, composed chiefly of fluor-spar, mixed up with capel and spots of ore; present end suspended, and in order to prove this lode deeper, a winze is now in the course of sinking below this level, within 13 fms. of the cross-course, and is down about 3 fathoms, in which the lode is much the same in appearance. The same level is driven west about the same distance (20 fms.), but this level I could not see, in consequence of a dam being put in for the purpose of getting a supply of water for condensing the whim-engine, when wanted to draw the stuff; but I have been told by the agent that the lode is much the same as in the level opened out east. The 80 cross-cut is extended north about 30 fms., intersected the north lode, and opened out east about 6 fms.; in the present end a small crossing has been met with, about which the ground appears to be more compact, but the lode at present does not contain any ore to value. The same level is driven west of cross-cut about 30 fms.; in places the lode is over 2 feet wide; although not containing any ore to value, it has a kindly-looking appearance, and in order to give this lode a further trial in depth a winze is about to be sunk in the cross-course, and when down 10 fms. most probably will intersect the lode, or thereabout, thus proving the lode 10 fms. deeper than the extreme bottom of the mine. I may as well mention that several other lodes have been cut in this cross-cut, which need not any remark. The 80 is extended south of engine-shaft about 85 fms., and several lodes and branches have been intersected in this driving, and driven on a short distance, and when commenced with they showed a somewhat kindly appearance, but when out of the influence of the cross-course the ground became hard, and the lode small. Being fully acquainted with the run of lodes in the adjoining mine, I should strongly advise that this cross-cut be continued with speed until it reaches the boundary, believing there are several other lodes still remaining to be cut; and, in my opinion, I consider it a very fair speculation, and ground easy for exploring. In conclusion, you will perceive by this report that the workings are confined to the bottom of the mine, and there are important points of interest to be looked at—viz.: A winze sinking below this level, on the engine lode, and one purposed to be sunk on the cross-course, for proving the north lode to a greater depth; I consider this mode of working the right and safe course to pursue, and to see the result before recommending the sinking of the engine-shaft, which I need not say will not only require time, but will create a considerable outlay as well; and, as I have before intimated, push on the south cross-cut as it has hitherto been to the boundary, believing it to be an important object. And if you are not working on a limited scale, I should strongly recommend an end to be driven west on one of the lodes as may be selected; although hard and poor at present it will give an idea whether or not a different channel of mineralised ground exists, and at the same time, when thought practicable, I should advise the driving of the north cross-cut to intersect Menadue lode; and my impression is, that at or about this depth we have a right to expect productive lodes.—W. Johns.

Sept. 20.—During the past quarter, or since your last general meeting, the different points of operation have been urged on without delay. I am very sorry that I cannot yet advise you of a good improvement in the mine. Having driven the 80, on the engine lode, about 20 fathoms east and west of shaft, and finding it to be generally 2 feet wide, of a kindly appearance, and yielding good stones of copper ore, but not enough to pay for working, I have, therefore, suspended the drivages, and have put the men to sink on the course of the lode below the 80; this winze is now over 3 fathoms deep, and the lode at the deepest place 2½ feet wide, very regular and well defined, and carries a little ore and mundic. We purpose to continue the sinking of this winze, for by doing so we can prove the lode 10 fathoms deeper quite as effectually, and more economically than if we were to sink the engine-shaft. The 80 west, on the north lode, has been extended some 30 fathoms; throughout this distance the lode has been of fair average width, and has produced excellent stones of ore, with kindly fluor-spar. An apparently favourable change has taken place in the composition of this lode in the 80, when compared with its character in the shallower levels. As already stated, it has yielded excellent stones of ore in the 80, but where operated on above the 80 it never showed a spot of ore; still, unfortunately, it is not found profitably productive at the deepest point: I have, therefore, been induced to suspend the driving west for the time, and sink a winze below the 80, with the view to prove it 10 fathoms deeper, and thereby see whether it continues to improve in a vertical direction. If the lodes in the winzes referred to should be found profitably productive in depth we can easily resume the sinking of the engine-shaft, and these winzes will always be of good service for ventilation; on the other hand, should the lodes not improve satisfactorily in depth, then we shall have given them the maximum of trial at the minimum cost. We have four men driving east of the cross-cut on the north lode, which is extended 6 fathoms. I am expecting to see a change in the character of the granite in driving east; until such change takes place we cannot reasonably expect any material improvement. The 80 cross-cut south is being forced on by six men; this cross-cut is extended 85 fathoms. We have passed through several lodes and branches, and have opened on most of these a short distance from the cross-course, by way of trial, so that not a single point in the mine should be neglected where there is a chance of making a discovery. I look upon the cross-cut south as a good speculation, and have always kept it going by six men, for there is no knowing how soon a good discovery may be made, whilst a portion of the sett remains unexplored, by not being cross-cut. We have tried costeaning, so as to be a sort of guide in ascertaining how far we may expect to drive, in order to intersect the lodes. But we find a layer of decomposed granite towards the foot of the hill, in the direction of our cross-cut, in which the back of the lodes do not crop out near the surface. Looking, however, at the bearing of the productive south lodes in the adjoining mines, we must have several before us to intersect, and I think one or two not very distant. I would recommend that the works in operation be continued with the same force. I cannot advise anything new being carried out, or a better or more economical mode of working. Our monthly expenditure is being kept as low as possible.—W. Rich.

The committee of management were re-elected. A vote of thanks to the Chairman terminated the proceedings.

NEW INVENTIONS.

PROVISIONAL PROTECTION for six months has been granted for the following:—

P. A. Lecomte de Fontainemoreau, 4, South-street, Finsbury.—Certain improvements in the manufacture or artificial stone. Aug. 27.

W. W. Burdon, Newcastle-on-Tyne.—Improvements in hewing or getting coal, and in apparatus employed therein. Sept. 2.

P. W. Barlow, Blackheath, Kent.—Improvements in constructing and working railways, and in constructing railway-tunnels. Sept. 9.

C. Moriarty, Greenwich, Kent.—Improvements in the manufacture of guards for preventing the escape of sparks from locomotive and other engines. Sept. 10.

LETTERS PATENT have been issued for the following:—

E. Lever, Manchester.—An improved mode or method of fixing hoops in the exterior of flexible tubing, employed in the ventiliation of mines and other similar purposes. March 26.

LIST OF SPECIFICATIONS published during the week:—

Manufacture of hoops, rails, &c., of cast-steel, 1s. 4d.; forging, rolling, and shaping, 8d.; retorts and furnaces for distilling coal, &c., 8d.; apparatus for hoisting stone, &c., 4d.; cutting and working stone, marble, &c., 4d. L. de Fontainemoreau.

Improved Safety-Cage.—An invention has been provisionally specified by Mr. N. J. Lebrun, of Brussels, which consists in a new or improved apparatus by which a mine cage is instantly arrested in its fall should the rope break. In the shaft opposite to, and at a convenient distance from each other, he fixes in a suitable framing two vertical wrought-iron bars, the inner surfaces of which are serrated or toothed, so as to form two ratchet racks extending from the top to the bottom of the said shaft. Between the said vertical bars, and flanged so as to be guided thereby, he places a wrought-iron or sheet-iron rectangular case, the two sides of which next the said bars are open, or partially open, so that the machinery contained in the said case may freely act upon the teeth of the rack when required. Through the said case passes a vertical wrought-iron rod, the top end of which is attached to the chain or rope from the top of the shaft, and its other end carries a nut or plate, by which when the rod is drawn upwards it carries with it the rectangular case, but it is capable of a limited downward motion through the bottom of the case. Above the case the rod is provided with an adjustable nut, to limit the extent of its motion downwards through the chest. Inside the said chest and at the four corners thereof, or in any suitable position, he places four, or more or less as required, pauls working loosely upon pins passing through the chest and rivetted thereto; the said pauls are acted upon by steel or other springs, which tend to force them into the teeth of the racks, but they are maintained in a vertical position, or pervented from yielding to the force of the springs by chains from the suspending rod of the chest, which chains, when the said suspending rod is drawn upwards, or suspended from above, keep the pauls from contract with the teeth of the rack, but when the said suspending rod is no longer acted upon by its suspending cord or chain, it falls downwards till stoped by the adjustable nut upon its upper part, and in its downward movement it releases the pauls from the action of the chains, which become slack, and the springs immediately cause the pauls to be locked into the teeth of the rack, and the whole is prevented from falling further. Any convenient number of platforms may be attached to the safety apparatus, or cages may be suspended to the lower end of the apparatus, in order to receive the persons or loads intended to raised or lowered.

Treating Tar, and obtaining Products therefrom.—The treatment to which Mr. George Lauder, of Glasgow, proposes to subject the liquid obtained in the manufacture of naphtha from coal-tar, and known as tar or dead oil, consists essentially in mixing the said oil with petroleum, naphtha, turpentine, or other hydro-carbon liquid, but preferably with petroleum spirit, subjecting the mixture to the action of an acid or acids, alkali or alkalis, and distilling the mixture to obtain the following products—namely, the spirit or hydro-carbon added to the tar or dead oil, refined tar or dead oil, or a mixture of these two, according to the weight required, and a thick lubricant. Experimentally, he has taken 100 parts of tar, or dead oil, added thereto 50 parts of petroleum spirits, and then to the mixture 4 per cent. of sulphuric acid. He thoroughly agitated these, and allowed such mixture to stand for (say) twelve hours; at the end of that time the sediment which had settled to the bottom of the vessel was drawn off. The mixture was then washed with water, and allowed to stand over a solution of chloride of lime for about six hours, the sediment was again drawn off, and the washing with water repeated, after which the mixture was pumped or passed into the still, and distilled over by the application of heat, and collected in receivers as required. The thick lubricant was the residue left in the retort after the oil was distilled over. Mr. Lauder's improvements in the apparatus employed in obtaining these products consist in the employment of a pipe or vessel between the still and receiver or receivers. Such pipe or vessel being filled to any desired level with water, dilute sulphuric acid, or other acid or acids, or an alkali or alkalis, over the surface of which liquid the distillate has to pass. The desired liquid level is maintained through a syphon, or other bent pipe, connected at its outer end to a source of supply.

Extracting Precious Metals from Lead.—An invention has been patented by Mr. Edward Beelback, of Newark, U.S., for an improvement in separating silver and gold from lead. He claims, first, the melting the lead which contains the silver and gold in a furnace with an inclined hearth, and drawing it off into a kettle containing, or to contain, a proper quantity of zinc to take up its silver and gold, instead of melting it in the kettle, as and for the purpose herein described and set forth.—Second, casting the mixture of lead, silver, zinc, and gold, after it has been sufficiently stirred for the zinc to take up the silver and gold into pigs or masses of suitable form and size to re-melt in the furnace.—Third, placing these pigs or blocks of lead, zinc, silver, and gold, in a furnace with an inclined hearth, and then subjecting them to a low degree of heat, sufficient to cause the lead to melt and run off, but not sufficient to melt zinc, silver, and gold.

PRICES OF MATERIALS,

As charged at Wheal Margery during the following months of 1864:—

Description.		March.		April.		May.		June.	
Hoop iron	Per cwt.	14s.	6d.	—		—		—	
Borer steel	„	45	0	—		—		—	
Best blister ditto	„	44	6	—		—		—	
Nails, 4-inch patent	„	20	9	—		—		—	
Ditto, 3-inch	per 1000	—		—		—		4s.	10d
Iron shovels	per cwt.	28	0	—		—		—	
Steel-point shovels	„	48	0	—		—		—	
7-16th chain	„	—		—		32s.	6d.	—	
11-16th ditto	„	—		27s.	0d.	—		—	
Leather	per lb.	1	9	1s.	9d.	1	9	—	
Longsound timber	per foot	0	9	0	9	0	9	—	
Dram timber	„	0	10	—		—		—	
Main Colliery coals, at St. Ives	per ton	10	10	10	8	11	0	11	2
Best candles, free of carriage	per doz.	5	3	5	3	5	3	5	3
Tallow, ditto	per cwt.	44	9	—		45	9	—	
Grease, ditto	„	—		26	0	—		26	0
Oil, ditto	per gallon	—		5	0	—		5	0
Powder, ditto	per 100 lbs.	46	0	—		—		46	0
Safety fuse	per coil	4d & 5d.		0	5	0	5	4d. & 5d.	
Rope, ditto	„	48	0	48	0	—		48	0
Hemp, ditto	per lb.	0	5½	0	5½	—		0	5½
White yarn, ditto	„	0	6	0	6	—		0	6
Hilts, ditto	per doz.	1	9	—		—		1	9

FOREIGN MINES.

Alten and Quænangen Mines.—Estimated produce for Aug.:—

Mines.	Ore.	Per cent.	Copper.
Quænangen	Tons 50	6½	3·250
Raipas	24	5	1·200
Old Mine	120	4½	5·400
United Mines	12	4	0·480
Total	Tons 206		10·330

Mining report from Aug. 20 to Sept. 9.

Quænangen.—Since our last I have again visited this place, and feel much pleasure in being able to confirm the very favourable accounts respecting the late discovery, which is situate about 3½ miles (English) north-west of the workings on lode E. The back has been laid open about 4 fathoms long by 3½ fathoms in width: throughout this space yellow ore is disseminated through a dark-coloured quartz mixture with great regularity. The debris (sand and boulders) varies from 1 to 3½ ft. in thickness, between which and the newstone there is a thin layer of gossany stuff, samples of which yielded about 3 per cent. for copper. The top, or part forming the crust of the mass, is less rich than below, the ore being much dispersed through the quartz, but at the deepest point (about 5 feet) a very gratifying change has taken place, where the quality has improved to fully 8 or 9 per cent. As no walls or sides are yet reached, the direction and dip of the lode cannot be stated correctly, but from indications I am inclined to believe that the former will be found to be east and west, and the latter northerly. Our time hitherto has been mostly occupied in clearing away the overburthen, erecting a small house for the workmen, and smithy, with other necessary work, in such an exposed situation, but these jobs are now in a forward state, and most of the hands will hereafter be employed on the lode, which I can only repeat presents a splendid appearance, and if it only continues as good as at present the result will soon tell its own tale; whilst, on the other hand, we would not wish to hold out too great hopes until the discovery is sufficiently developed to enable us to form some idea as to the size, value, &c. The stope below the 10 fathom level, on lode E, yields 3 tons of ore per fathom, and that below the deep adit east continues to yield about 2 tons per fathom. The tribute workings below the 10 fathom level look tolerably well, in one of which a caunter vein strikes off in the hanging side, which is worth 2½ tons of ore per fm. In the pitch at the C mine, the back of the lode is laid open for about 3 fathoms long, where it varies from 2 to 4 feet in width; worth in the east end 3½ tons of fine quality work per fm. Most of the unproductive bargains at E and here are suspended for the present, the men being required on the new discovery, so as to do as much as possible before the winter sets in.

Raipas.—The lode in the shallow adit foot stope is about 2 feet wide, yielding 2½ tons of ore per fathom. In the south-west working, above the 10 fm. level, the lode is 2½ feet wide, worth 2 tons of ore per fathom, the quality of which has rather improved. The small vein of ore in the 20 is somewhat larger than before, and the character of the ground is of a very congenial description for mineral. The water is drained to the level of the 30, but it will still take some time before we can resume operations at that point.

Old Mine.—The rise above the 5 was holed to the working about a day or two since, so that the ventilation is now very good, and the men relieved therefrom will be employed to open on the lode east of the cross-course, where it is orey and promising. In the 5 north the lode is 1 fathom wide, composed of quartz and calc-spar, with some ore intermixed, though not so rich in the latter as when last reported. In the working above the 5 the lode is 8 ft. wide, worth about 2 tons of ore per fathom, which, as before, is much disseminated through the matrix. The 5 fm. level foot stopes (two) continue to yield from 3 to 3½ tons of ore per fathom, where the lode is large and promising. In No. 1 working we are engaged stripping down some lode from the side, where it is rather irregular in size, &c., but the quality of the work is tolerably good, and pays well for taking down. In the 10 fm. level stope south the lode is 6 ft. wide, yielding about 3 tons of ore per fathom. In the winze against Carr's adit the ground is stiffer than when last reported, which, combined with the recent increase of water, impede our progress, but still we fully expect to hole this month. The ground in Carr's rise is of the same character as that in the winze. We have large quantities of stuff in the mine at different points, which we are collecting in order to tram out before the frost sets in. At Ward's the lode is about 4 ft. wide, worth on an average 2 tons of ore per fathom; the other points here, as well as at Woodfall's, has not materially altered since our last. We have advices from Quænangen up to yesterday, which report the new discovery to be equally productive and promising as before.—C. Trelease.

Copiapo.—G. Matthews, August 15: Checo Mine: In the 70, east of Price's shaft, the lode in this chiflon is much the same as when last reported; a good lode of ore driven, and sunk since our last 2·50 metres; the stopes have become rather poor, and are stopped for the present. In the 60, at Price's shaft, cross-cut, the ground is not so hard as when last reported, in which we believe we have the south part of the lode; you will see more about it in our next report: driven since our last 1·50 metres. In the 60 chiflon, at Price's shaft, the lode is much the same as when last reported, very promising; driven since our last 2 metres. The 65 end, driving west, is the one spoken of in our last: at present the lode is improving in quality; it is now producing about 4 tons of 12 per cent. ore per fm., looking very kindly; driven since our last 2 metres. We have four men working on different parts of the mine that are not reported, because they are removed so often.—Western Sett: In the 40, north of new shaft, the lode in the end driving west is still poor: driven since our last 1·50 metres. Total metres driven and sunk 9·50. Number of men employed in July:—English, 3; natives, 36—total 39.

United Mexican.—Guanaxuato, August 29: Mine of Jesus Maria y Jose: In this mine there is no great change. The ore for the haciendas is being extracted from the rebaje de Santiago, three pozas on the costra alta in la Trinidad, and various other workings. The frente de San Juan north is somewhat poorer than last month. A pozo has been opened by destajo in the frente de la Trinidad, on the north-west and south-east vein, with the intention of communicating that labor with the contracielo de San Juan; in the month 8·35 varas have been driven in it on fair ore. The cross-cut of San Carlos has been stopped, as our horses from low feeding, owing not only to the high price but at times even to the absolute want of maize, are unable to draw the water and attle from the lowest despacho. A pozo in continuation of San Bernardo has, however, been opened to go towards the point in which San Carlos will cut the lode. We have driven in it 4·75 varas, and found some good "ojos" (bunches) of ore, through the great mass of the lode is poor. The attle is being left in the lower workings to fill up with when required. The extraction during the month has been 3865 cargas for the hacienda account, and 2750 cargas by the buscones; the latter sold for $10,221·74. In the campos de buscon there is nothing new worthy of remark. The result of last month's working shows a loss of $5228·35. The question about the demasias (unappropriated ground) of which we have received possession, is not yet cleared up.—Mine of la Trinidad: There is nothing doing in this mine. A few buscones who are at work there will keep up the amparo (company's rights).—Mine of Guadalupe de la Oscura: The contract is signed and delivered, and as soon as Mr. Fitzherbert is better he will receive the mine from the owners. This ground must be all well surveyed before works are undertaken: I have only made partial measurements in it. A great deal of work has been commenced and left unfinished, of which the company will get the benefit without any expense or debt against the mine, the former speculators having completely abandoned their undertakings. The scarcity and high price of forage continue, which, of course, preclude the possibility of profits on hacienda operations, and also cause great extra outlay at the mines, as many articles of consumption rise in proportion. The rains, however, thus far have been constant and copious, and we look forward with hope to very abundant crops. The distress and famine have been, and still are extreme, and the sufferings of the poor have not been so much attended to as could have been desired, nor can they be much alleviated till the new crop is harvested two or three months hence.

New Wildberg.—Z. Walls, Sept. 24: At the deep adit level we have cut through the Gottes Hulfe lode, and find a branch of ore on the hanging part of the same, worth about 25 cwts. of silver-lead ore per lachter; about 8 lachters above the back of this level we have two pitches at work on the same branch, producing about 30 cwts. of silver-lead ore per lachter for each pitch. The drivage at the 20, on the foot-wall part of the Dornergang, has improved since last reported, and is now worth 30 cwts. of silver-lead ore per lachter. The drivage west at this level, on the hanging part of the lode, has also improved, worth from 15 to 20 cwts. of silver-lead ore per lachter, and from its present appearance is likely to still further improve. The lode in the forebreast of the 20, driving east on the Erbteilstergang, is letting out a great deal of water, and showing some good spots of ore, but not yet enough to value. In the 10, driving east from Michael's shaft, the lode continues to produce 3 tons of silver-lead ore per lachter, but the ground is very hard and spare for driving. We have no other change in the underground department since my last report; but, on the whole, I am glad to say the mine is looking well, and all the work, both underground and at surface, is proceeding satisfactorily.

Nova Scotia Land and Gold Crushing and Amalgamating Company.—From Oldham, the agent writes:—"We have started the crusher this morning, with a good supply of quartz on hand. There has been no change in the position of the Hall lode since the date of my last report. The character of the quartz is considerably improving as we increase in depth. The size of the lode as we now have it is about 1½ inch thick, and we are anticipating another rich deposit when we meet with the slate. From Sherbrooke, the agent writes:—We are now stoping down 30 feet on the Sears lode, and we have about 6 ft. of the lode stripped, but have not taken any off yet, consequently we can say nothing about its quality. In stoping down this piece the rock has exactly the same appearance as it had in the shaft, and those lodes are coming in from the south the same as in the shaft, and I believe as soon as we get through those lodes we shall meet with the main lode all along the stope, the same as in the bottom of the shaft, about 8 in. wide, and producing about 2 ozs. per ton.

New Mining Company Law in Australia.—A bill of much importance to the mining community has been introduced into the Adelaide Assembly, by Mr. Neales, the object being not only to secure limited liability to public companies, but also to introduce the admirable principle of anonymous partnerships, so well known on the Continent. There can be no doubt that there are a vast number of useful enterprises which would be developed, and yield large profits, could capitalists invest upon the principle of the *société anonyme*. That there is more security to the creditors of a company keeping a register of shareholders than of an anonyme company cannot be shown, since according to the law at present in force in England there is nothing to prevent the full nominal value of the share being called up, when the responsibility of the shareholder entirely ceases, so that it must be immaterial to the creditor whether his name be known or not. It is to be hoped that the anonyme system will hereafter be introduced both in Australia and in England. Mr. Neales's bill proposed to authorise the promoters of companies "to issue shares on which the full amount of capital represented by such shares has been paid, entitling the holder, who need not be named in such share, to all the rights and advantages of a shareholder; and in such latter case some distinguishing mark or number shall be made on such share, and such mark or number shall be substituted for the name of the shareholder in the list hereinbefore required to be kept by the manager, and supplied to the registrar of joint-stock companies;" and in another clause it was provided that at any meeting of the company the holders of anonymous shares who might have deposited their shares with the manager at least three days prior to any such meeting might vote in respect of such shares in the same proportion as other shareholders; and the manager, on such share being deposited, would be required to give a receipt and voting-paper for the shares, specifying the number so deposited, and should return such shares on demand. To such provisions we cannot see any possible objection, whilst the encouragement which would be given to the development of enterprise would be incalculable. As Mr. Strangways very truly observed, such an investment would not differ from a man's keeping his money in bank notes, and placing them up a chimney. So far as the general body of creditors are concerned the cases would be alike.

Water Rights.—It has been held by the Court of Exchequer, in the case of the Stockport Waterworks Company *v.* Porter, that where a riparian proprietor granted land, part of his former riparian estate, but separated from the stream by land of the granter not included in the grant, with a grant from the granter of a right to lay pipes from the stream to the granted land, and take water by means of them from the stream to such granted land, the grantee could not maintain an action in his own name against a riparian proprietar for fouling the waters of the stream, but he could enforce his right as against the granter.

First Class Silver Medal, Royal Polytechnic Society, Falmouth, 1864.

CREASE'S PNEUMATIC TUNNELLING ENGINE, for SUPERSEDING the SLOW and EXPENSIVE USE of MANUAL LABOUR in SINKING SHAFTS, DRIVING LEVELS, TUNNELLING, &c., is guaranteed to drive through any rock of average hardness at a minimum rate of 1 fm. per diem and to sink shafts at the rate of 2 fms. in three days.

Mr. CREASE will undertake contracts for sinking shafts, driving levels, &c., at an enormous reduction of time and great saving in cost.

Applications to be addressed (for the present) to the patentee, Mr. E. S. CREASE, Tavistock, Devon.

Gun Cotton Manufactory.

MESSRS. THOMAS PRENTICE AND CO., GREAT EASTERN CHEMICAL WORKS, STOWMARKET, SUFFOLK.

This manufactory has been established for the purpose of preparing GUN COTTON, according to the Austrian process, and was opened on the 26th of January last, under the inspection of Baron Lenk. Messrs. Thomas Prentice and Co. are now able to SUPPLY GUN COTTON, in its most approved form, either for the purposes of engineering and mining, or for military and submarine explosion, and for the service of artillery, as a substitute for gunpowder.

The advantages of Baron Lenk's GUN COTTON are the following:—

FOR PURPOSES OF ARTILLERY.—The same initial velocity of the projectile can be obtained by a charge of gun cotton one-fourth of the weight of gunpowder. There is no smoke from the explosion of gun cotton; it does not foul the gun, nor heat it to the injurious degree of gunpowder. There is much smaller recoil of the gun. The same initial velocity of projectile is produced, with a shorter length of barrel. In projectiles of the nature of explosive shells it breaks the shell more equally into much more numerous pieces than gunpowder. When used in shells, one-third the weight of gun cotton produces double the explosive force of gunpowder.

FOR CIVIL ENGINEERING AND MINING.—In driving tunnels through hard rock a charge of gun cotton of given size exerts double the explosive force of gunpowder, thus a smaller number of holes is necessary. It may be so used as, in its explosion, to reduce the rock to much smaller pieces than gunpowder, and so facilitate its removal. As gun cotton produces no smoke, the work can proceed much more rapidly, and with less injury to the health of the miners. In working coal mines the advantages of bringing down much larger quantities of material with a given charge, and the absence of smoke in the explosion, enable a much greater quantity of work to be done in a given time at a given cost. The weight of gun cotton required to produce a given effect in mining is only one-sixth part of the weight of gunpowder. In blasting rock under water the wider range and greater force of a given charge is a great element in cheapening the cost of submarine work. The peculiar local action of gun cotton, to which the effects of gunpowder show no analogy, enables the engineer to destroy and remove submarine stones and rocks, without the preliminary delay and expense of boring chambers for the charge.

FOR MILITARY ENGINEERING.—The facility of transport is increased, the weight of gun cotton being one-sixth that of gunpowder. The peculiar localised action of gun cotton facilitates the destruction of bridges and palisades, and every obstacle. For submarine explosion, gun cotton has the advantage of a much wider range of destructive power than gunpowder. For the same purpose gun cotton, from its lightness, has the advantage of keeping afloat the water-tight case in which it is contained, while gunpowder sinks it to the bottom.

FOR NAVAL WARFARE.—In the batteries of ships, between decks, and in casemated forts, the absence of smoke facilitates continuous rapid firing. The absence of fouling and of heating are equally advantageous for naval as for military artillery.

GENERAL ADVANTAGES.—Time, damp, and exposure do not alter the qualities of the patent gun cotton. It has already been preserved 10 years without injury or decay. It can be transported through fire without danger, simply by being wetted, and when dried in the open air it becomes as good as before. In the case of a ship, or a fortress, or a city being on fire, this quality may be of the greatest value. It is much safer than gunpowder, owing to its being manufactured in the shape of rope or yarn. It cannot escape from its package, or be spilled by accident. The patent gun cotton is entirely free from the danger of spontaneous combustion, and secures that degree of safety and certainty which, at the time of the original invention, the gun cotton of Schönbein did not possess.

Messrs. THOMAS PRENTICE and Co. are now in a position to contract with the owners of mines, engineers, contractors, and governments for gun cotton prepared in the various forms required for their use. Mining charges will be supplied in the rope form, according to the diameters of bore required, and gun cotton match-line, as well as instructions for using it in mines, will be supplied with it.

The great advantage of gun cotton make its use in practice very much cheaper than its comparative price would appear to show; in blasting rock, for example, the rapidity and quantity of the work done, with a given expense of wages, &c., is largely in favour of gun cotton.

Messrs. THOMAS PRENTICE and Co. are also prepared to manufacture the gun cotton, and deliver it in the form of gun cartridges, adapted to every description of ammunition; all they require for this purpose being a drawing of the gun, gunpowder cartridges, and ammunition, with the specification of weights, sizes, and initial velocities.

Artillerists who prefer to manufacture their own cartridges may make special arrangements with the patentee through Messrs. PRENTICE and Co.

Stowmarket, March 10, 1864.

NEW COMBINED TURBINE, WINDING, AND PUMPING MACHINERY, MANUFACTURED by GEORGE LOW, MILLGATE IRONWORKS, NEWARK-UPON-TRENT,

Who respectfully begs to bring the above to the notice of the mining public, as an exceedingly cheap and easy method of applying water-power for the above purposes.

The TURBINE, WINDING, and PUMPING MACHINERY are all fixed complete to one strong cast-iron bed plate, which can be placed in any situation without pit or excavation, and any height not exceeding 33 ft. from bottom of fall, the supply and suction pipe being all that is required to be connected to it, and can be brought in any direction. This combined machine can be easily removed when necessary.

G. Low begs also to state that the TURBINE is the most efficient and the cheapest method of applying water-power for mining purposes.

MANUFACTURER of WINDING, PUMPING, CRUSHING, STAMPING MACHINERY, WINDING ENGINES, WATER WHEELS.

IMPROVED TURBINE WATER WHEELS CONSTRUCTED either to WORK VERTICALLY or HORIZONTALLY, and upon the MOST SCIENTIFIC and EFFECTIVE PRINCIPLE.

G. Low begs to recommend a special class of turbine adapted for extreme high falls (200 to 500 ft.), and consuming small quantity of water. This turbine will work with equal advantage without running at an excessive velocity. Also,

MANUFACTURER of IMPROVED BORING MACHINES for DRIVING ADITS.

TO IRON AND COAL MASTERS, MINING AND QUARRY COMPANIES, &c.
IMPROVED BLACK VARNISH,
FOR PREVENTING IRON FROM RUST, AND WOOD FROM DECAY.

A BRILLIANT JET BLACK, SUPERIOR to PAINT in APPEARANCE, dries in less time, contains preservative qualities of the best description, and is economical in its use; one gallon, at 1s., is equal to 14 lbs. of paint, which costs 4s. For COLLIERY HEAD GEARING, RAILWAY WAGONS, BOILERS, CASTINGS, CANAL BOATS, &c., it is especially adapted. In casks containing 10, 15, and 20 cwts. each. In quantities of 1 ton and upwards, price £11 per ton.

TURPENTINE SUBSTITUTE.

GLOVER and Co. have now on hand a really splendid painting sample of spirits of turpentine substitute, a pure crystal, not more volatile than the genuine American turpentine, and quite inoffensive to smell. Price, 2s. per gallon, in 30-gallon casks.

PETROLEUM.

This oil gives a pure, white, soft, and brilliant light, easily regulated, and portable. For works or public buildings, where gas is not desirable, the brilliancy and economy of the article are unequalled.

WASTE NO OIL.

STRONG IRON OIL CISTERNS.

Not liable to leak, and which economise space in the stores. From 600 gallons, 48 diameter by 84 in height, price £10 10s., down to 10 gallons, 15 diameter by 21 in height, price 10s., WITH EVERY VARIETY OF SIZE AND PRICE BETWEEN.

STRONG IRON BUCKETS:—

2¼ galls. .. 4s. 6d. | 3 galls. .... 5s. 0d. | 3½ galls. .. 5s. 6d. | 4 galls. ....6s. 0d.

WAGON GREASE.

GLOVER AND CO., No. 40, MANESTY LANE, LIVERPOOL.

THE BANKING, MINING, AND JOINT-STOCK COMPANIES REVIEW, A JOURNAL OF COMMERCE, TRADE AND MANUFACTURE, SCIENCE AND THE ARTS.

Published every Wednesday. Subscription, £1 1s. annually. Price 6d. stamped.

RAILWAYS AND MINES

Capitalists who seek safe and profitable investments, free from risk, should act only upon the soundest information. The market prices for the day are for the most part governed by the immediate supply and demand, and the operations of speculators, without reference to the *bona fide* merits of the property. Railways depend upon the traffic, expenditure, and capital accounts, the probabilities of alliance or competition with neighbouring companies, the creation of new shares, the state of the money market as affecting the renewal of debentures, and other considerations founded on data to which those only can have access who give special attention to the subject. Mines afford a wider range for profit than any other public securities. The best are free from debt, have large reserves, and pay dividends bi-monthly varying from £15 to £25 per cent. per annum. Instances frequently occur of young mines rising in value 400 or 500 per cent. But this class of security, more than any other, should be purchased only upon the most reliable information. The undersigned devote special attention to railways and mines, afford every information to capitalists, and effect purchases and sales upon the best possible terms. Thirty years' experience in mining pursuits justifies us in offering our advice to the uninitiated in selecting mines for investment; we will, therefore, forward, upon receipt of Post-office order for 5s., the names of six dividend and six progressive companies that will, in our opinion, well repay capitalists for money employed.

Messrs. TREDINNICK AND CO., STOCK and SHAREBROKERS, and DEALERS IN BRITISH MINING SHARES, 78, LOMBARD STREET, E.C.

THE MECHANICS' MAGAZINE, AND JOURNAL OF THE APPLIED SCIENCES.—Established 40 years.

The Mechanics' Magazine has from its establishment had an extensive circulation, and it communicates, for 4d. per week, far more valuable information, both scientific and practical, than was ever before placed within the reach of even those who could afford to pay six times as much for it.—*Lord Brougham.*

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THE BUILDING NEWS.—An Illustrated Journal, price 4d., devoted to Architecture, Civil Engineering, the Arts of Design and Building. It contains original and practical Essays on Fine Art and on the Principles and Practices of Construction, Notices of New Buildings in all parts of the kingdom, Reports of Architectural and Scientific Societies, Notes on Church Decorations, Memorials and Stained Glass; Sanitary, Gas, Water, and other intelligence; Improved Dwellings for the Working Classes; Lists of Tenders received, and of Competitions and Contracts open; suggestions (oftentimes illustrated) on subjects specially interesting to Architects, Builders, Contractors, and their Employees; correct weekly lists of all new patented inventions connected with every branch of the building trade, and a variety of interesting miscellaneous matter.

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International Exhibition, 1862—Prize Medal.

JAMES RUSSELL AND SONS (the original patentees and first makers of wrought-iron tubes), of the CROWN PATENT TUBE WORKS, WEDNESBURY, STAFFORDSHIRE, have been AWARDED a PRIZE MEDAL for the "good work" displayed in their wrought-iron tubes and fittings.

Warehouse, 81, Upper Ground-street, London, S.

Prize Medal—International Exhibition, 1862.

CHAPLIN'S PATENT PORTABLE STEAM ENGINES, &c., for PUMPING AND WINDING.

These engines are SPECIALLY ADAPTED for PITS, QUARRIES &c. They are EXCEEDINGLY SIMPLE in ARRANGEMENT, and STRONG. NO FOUNDATION or CHIMNEY STALK being NECESSARY, they can be ERECTED or REMOVED with VERY LITTLE TROUBLE or EXPENSE, and are WELL ADAPTED for HOME or FOREIGN USE.

Sizes, from 2 to 25 horse power.

STEAM CRANES, STEAM WINCHES, CONTRACTORS' LOCOMOTIVES, HOISTING ENGINES, PUMPING AND WINDING GEARING, &c.

ALEXANDER CHAPLIN AND CO., CRANSTONHILL ENGINE WORKS, GLASGOW.

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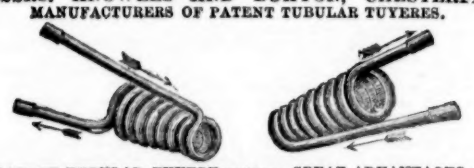
DEPOT.
LOWER FORE STREET, LAMBETH, S.
(Near the steamboat pier.)

MESSRS. KNOWLES AND BUXTON, CHESTERFIELD.
MANUFACTURERS OF PATENT TUBULAR TUYERES.



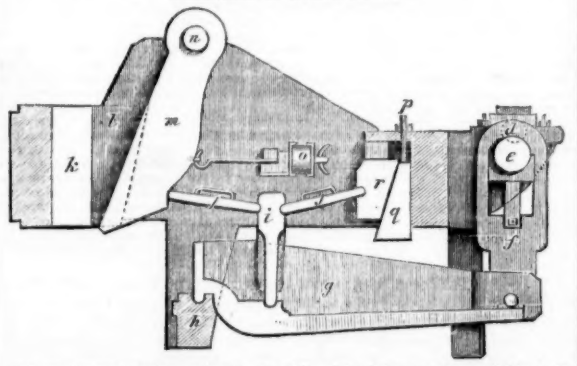
The PATENT TUBULAR TUYERE possesses GREAT ADVANTAGES over the ORDINARY TUYERES, both for its DURABILITY and EASY WORKING. A current of cold water going direct to the nozzle prevents their destruction, however much they may be exposed to the fire.

We repair them at half the first cost, making them equal in size to new ones, all parties returning them carriage paid.

No. 1 tuyere,	16 in.	long	28s. each.
No. 2	18	"	32s. "
No. 3	20	"	36s. "
No. 4	22	"	40s. "
No. 5	24	"	44s. "

Delivered at Chesterfield station. Terms, nett cash quarterly.

BLAKE'S PATENT STONE BREAKER, OR ORE CRUSHING MACHINE,
FOR REDUCING TO SMALL FRAGMENTS ROCKS, ORES, AND MINERALS OF EVERY KIND.



It is rapidly making its way to all parts of the globe, being now in profitable use in California, Washoe, Lake Superior, Australia, Cuba, Chili, Brazil, and throughout the United States and England.

The above section illustrates Blake's Stone Breaker, just as made the last five years, and is fully protected in every part by patents.

Extract from Specification:—A short but powerful vibration is imparted to one or both of the jaws by any convenient arrangement, and combination of powerful levers, worked by a crank or eccentric on the main shaft.

LEGAL PROCEEDINGS will be taken at once against any person or persons found making, using, or vending any machine, the construction of which will constitute an infringement on the above patent. Read extracts of testimonials:—

Alkali Works, near Wednesbury.—I at first thought the outlay too much for so simple an article, but now think it money well spent. WILLIAM HUNT.

Welsh Gold Mining Company, Dolgelly.—The stone breaker does its work admirably, crushing the hardest stones and quartz. WM. DANIEL.

Our 15 by 7 in. machine has broken 4 tons of hard winstone in 20 minutes, for fine road metal, free from dust. MESSRS. ORD and MADDISON, Stone and Lime Merchants, Darlington.

Kirkless Hall, near Wigan.—Each of my machines breaks from 100 to 120 tons of limestone or ore per day (10 hours), at a saving of 4d. per ton. JOHN LANCESTER.

Ovoca, Ireland.—My crusher does its work most satisfactorily. It will break 10 tons of the hardest copper ore stone per hour. WM. G. ROBERTS

General Frémont's Mines, California.—The 15 by 7 in. machine effects a saving of the labour of about 30 men, or $75 per day. The high estimation in which we hold your invention is shown by the fact that Mr. Park has just ordered a third machine for this estate. SILAS WILLIAMS

For circulars and testimonials, apply to—

H. R. MARSDEN, SOHO FOUNDRY,
MEADOW LANE, LEEDS.
Only maker in the United Kingdom.

BASTIER'S PATENT CHAIN PUMP APPARATUS FOR RAISING WATER ECONOMICALLY, ESPECIALLY APPLICABLE TO ALL KINDS OF MINES, DRAINAGE, WELLS, MARINE, FIRE, &c.

J. U. BASTIER begs to call the attention of proprietors of mines, engineers, architects armers, and the public in general, to his new pump, the cheapest and most efficient ever introduced to public notice. The principle of this new pump is simple and effective, and its action is so arranged that accidental breakage is impossible. It occupies less space than any other kind of pump in use, does not interfere with the working of the shafts, and unites lightness with a degree of durability almost imperishable. By means of this hydraulic machine water can be raised economically from wells of any depth; it can be worked either by steam-engine or any other motive power, by quick or slow motion. The following statement presents some of the results obtained by this hydraulic machine, as daily demonstrated by use:—

1.—It utilises from 90 to 92 per cent. of the motive power.

2.—Its price and expense of installation is 75 per cent. less than the usual pumps employed for mining purposes.

3.—It occupies a very small space.

4.—It raises water from any depth with the same facility and economy.

5.—It raises with the water, and without the slightest injury to the apparatus, sand, mud, wood, stone, and every object of a smaller diameter than its tube.

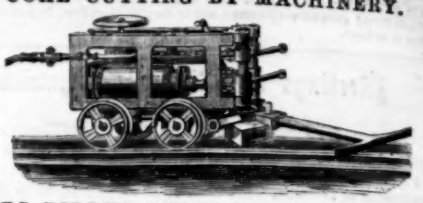
6.—It is easily removed, and requires no cleaning or attention.

J. U. BASTIER, sole manufacturer, will CONTRACT to ERECT his PATENT PUMP at HIS OWN EXPENSE, and will GUARANTEE IT FOR ONE YEAR, or will GRANT LICENSES to manufacturers, mining proprietors, and others, for the USE of his INVENTION.

OFFICES, 47, WARREN STREET, FITZROY SQUARE.

London, March 21, 1859. Hours from Ten till Four. J. U. BASTIER C.E.

COAL CUTTING BY MACHINERY.

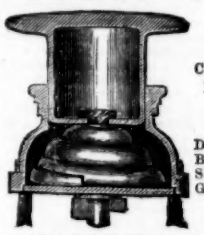


MESSRS. RIDLEY AND CO. have, by recently PATENTED IMPROVEMENTS, COMPLETED their TRUNK COAL CUTTING MACHINE, WORKED by COMPRESSED AIR, and are NOW PREPARED to NEGOCIATE for the USE, and to SUPPLY MACHINES, which will be found to COMBINE SIMPLICITY of CONSTRUCTION with PORTABILITY and ECONOMY in WORKING. By the use of these machines a CONSIDERABLE SAVING of COAL is EFFECTED, and the COST of LABOUR MUCH REDUCED. Each machine will be guaranteed as to its capabilities, &c.

All applications to be made to Messrs. RIDLEY and Co., No. 11, South-street, Finsbury London, E.C.; or Mr. PERCY BANKART, agent, 9, Clement's-lane, E.C.

*** COLLIERY PROPRIETORS are CAUTIONED against PURCHASING or USING MACHINES, the construction of which will constitute an INFRINGEMENT of the ABOVE PATENT.

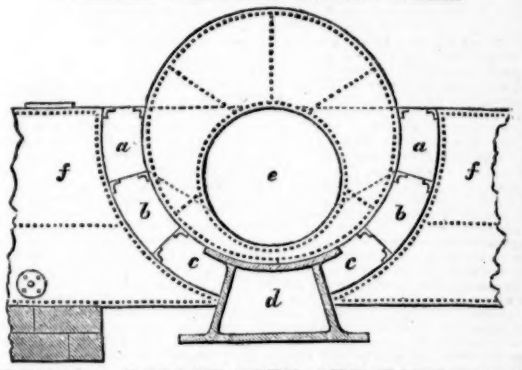
THOMAS TURTON AND SONS,
MANUFACTURERS OF



CAST STEEL for PUNCHES, TAPS, and DIES, TURNING TOOLS, CHISELS, &c.
CAST STEEL PISTON RODS, CRANK PINS, CONNECTING RODS, STRAIGHT and CRANK AXLES, SHAFTS, and
FORGINGS of EVERY DESCRIPTION.
DOUBLE SHEAR STEEL, BLISTER STEEL, SPRING STEEL, GERMAN STEEL.
FILES MARKED T. TURTON, EDGE TOOLS MARKED WM. GREAVES & SON
Locomotive Engine, Railway Carriage and Wagon Springs and Buffers.

SHEAF WORKS AND SPRING WORKS, SHEFFIELD.
LONDON WAREHOUSE,—35, QUEEN STREET, CANNON STREET, CITY, E.C. where the largest stock in the world may be selected from.

PATENT FLUE AND TANK BOILER.



JEWELL'S PATENT FLUE AND TANK BOILER.
A PLAN FOR ECONOMISING THE CONSUMPION OF FUEL IN STEAM BOILERS.

The advantages of this boiler, an illustrated description of which was published in the MINING JOURNAL of October 3, are obvious.

It is provided with WROUGHT IRON FLUES, conveying the fire entirely over the surface of boiler below the water line, and wholly doing away with lime coming in contact with any part of the boiler, lime having been found to destroy the boiler plates before any other parts are the worse for wear. This boiler has four additional flues to the plan at present adopted, thus affording a FAR GREATER AMOUNT of HEATING SURFACE, and MORE EFFECTUALLY CONSUMING the GASES. Between the boilers a wrought-iron tank is fixed, extending the whole length of the boilers, for containing water for feed; this water will pass into the boiler at any temperature required. This boiler will not require anyone to enter the flues for cleansing, as the flues are provided with shifting stoppers at the ends, enabling a person to cleanse the flues even while the boiler is hot; this plan answers for any size or length boiler, and will do away with the cold water feed, which has been the cause of so many accidents. These flues are made of wrought or cast-iron. On the top of the tank a pipe will be placed, to take the waste steam that escapes and carry it to the cistern. The flues for a 6 ft. boiler will be 2 ft. long, and the usual width. It must be remembered that the tank once hot will remain a hot body, with the same amount of heat that passed off before in the brick flues. I would observe that there will be no more water taken from these tanks than will be required for the feed, consequently no more cold water will pass into these tanks than will be necessary for feeding. It is believed this plan will SAVE TEN FEET in the LENGTH of BOILER, and it has been proved to EFFECT a SAVING of rather MORE than ONE-THIRD in the CONSUMPTION of FUEL. These boilers, with flues and tanks, can be supplied on the most reasonable terms.

NOTE.—This plan of Flues and Tank Boiler will be found very beneficial for MARINE ENGINES; the tank would receive the water from the sea, and would not only become hot for feed, but would be the means of preventing in a great measure the salt from passing into the boiler. Where great quantities of hot water are required for other purposes, these tanks will also be found very beneficial. JOHN JEWELL.

Basset Foundry, Devoran, September 30, 1863.

*** Mr. JEWELL is PREPARED to GRANT the ROYALTY to any parties, for certain districts of the United Kingdom.

Works published at the MINING JOURNAL *office, 26, Fleet-street, London.*

PRACTICAL TREATISE ON MINE ENGINEERING. By G. C. GREENWELL. In one vol., half-bound, £2 15s.; whole bound in Morocco, £3 10s. In two vols., half-bound, £3 3s.

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LONDON: Printed by RICHARD MIDDLETON, and published by HENRY ENGLISH, (the proprietors), at their office, 26, FLEET-STREET where all communications are requested to be addressed. [Oct. 1, 1864.